LALA ASSOCIATES ENGINEERS LLC

STORM WATER REPORT

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42 SUMMER STREET, MA

PROPOSED MULTIFAMILY RASIDENTIAL

PREPARED BY
Kanayo Lala / Sanjay Kaul
4/18/2019

UPDATED 6/24/19

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TABLE OF CONTENTS

INTRODUCTION

This report presents a description along with supporting calculations for the stormwater runoff treatment and mitigation systems proposed for the new multifamily appartment building at 42 SUMMER STREET in MAYNARD as presented on a plan set Site Plan of Land in MAYNARD, MA" prepared by Lala Associates Engineers, LLC with an original date of April 18, 2019.

EXISTING SITE

The proposed development lies on a half acre(20,952sf) parcel of land on the southerly side of Summer Street in MAYNARD. The site is flat in the front 40feet with 2% slopes and all of the remaining with 5 to 35 % slopes. The site has existing home with garage in the basement level.
The existing house was built in 1960s and is to be demolished. All existing patios and driway pavement will be removed.

SOILS

The soils conservation service maps indicate that the site is comprised of Loamy Sand to Stratified Gravel (602), which is in the Class A hydrologic soil group. This classification has been confirmed by a test pit conducted on the site with exception that sand is much larger particle size in the course sand grade. Refer to Attachment Form 11 for soils information and test pit log on sheet C1. One test pit is done close to lower leaching field. The perc rate of the soils is under three minutes per inch. Due to small lot size, no variation is expected in the soils.

GROUDWATER CONDITIONS

Seasonal-high groundwater indicators were not observed in the test holes. Groundwater is assumed to be at more than 10feet depth. No moisture was noticed in the soils.

SOIL PERMEABILITY

Permeability tests were conducted in the test hole, with result at 20 inches per hour. A factor of safety of 800% has been used for permeability for the infiltration calculations at 2.4" per hour as required by the DEP regulations for Class A soils.

FLOOD PLAIN

The site does not lie in the 100 year flood plain. The nearest surface water (a river) is more than 600 feet away at 30 to 40 feet below)

WETLAND PROTECTION ACT -

No wetland are found around the property in 100 feet or more..

Stormwater Management Report

The site design incorporates the requirements of the Massachusetts Department of Environmental Protection Agency (MADEP) Stormwater Management Standards as outlined in the MA Stormwater Handbook. The project's MADEP Checklist for Stormwater Reports is attached to this summary.

Standard No.1 - Stormwater Treatment & Discharge - *No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.* – The proposed project will not have a defined discharge point, but will allow for sheet flow as an overflow of the the catchbasin grates used as the overflow outlet of the infiltration systems. The proposed stormwater storage system will contain all of the roof and most of the driveway and parking of the runoff in order to control rate & volume, as well as to infiltrate the first flush for water quality purposes. Stormwater runoff from the overall, existing site will be such that there is a reduction in the rate and volume of runoff versus the existing conditions. The overflow in the 100 year storm only from the trenchdrain will pond in the parking arae prior to draining back into the trenchdrain and in the leaching field in last four hours of the storm. As the rate and volume from the site has been controlled and there is no point source discharge, there will be no erosion at a drain outlet that can be attributed to the proposed project. As such, the proposed site development meets the MADEP Stormwater Management Standard. No adverse impacts to the water quality of the adjacent waterway will occur due to the proposed site development..

Standard No.2 - Peak Discharge Rates – *Stormwater management systems shall be designed so that the post-development peak discharge rates do not exceed pre-development discharge rates.* - Under existing and proposed conditions, hydrologic/hydraulic analyses were performed utilizing the computer program, HydroCAD, in order to determine the peak rate of discharge for existing and proposed conditions. Runoff hydrographs were generated for the 2, 10, & 100 year storm events using the SCS TR-20 Method, refer to HydroCAD Input / Output data. Under the proposed conditions, the post-development runoff hydrographs for the site subcatchments were routed through the proposed two stormwater storage / infiltration facilities. One is for the roof runoff and the second is for the runoff from the driveway and lawn areas.

Table 1 summarizes the pre-and post development runoff discharge rates and volumes determined in the hydrologic/ hydraulic analyses performed for the project site.

Table 1 - Comparison of Peak Runoff Discharge Rates (HydroCAD)

Storm Event	Existing Peak Runoff Rate cfs*	Existing Peak Runoff Volume (cft)	Proposed Peak Runoff Rate cfs*	Proposed Peak Runoff Volume (cft)	% Change in Rate/Volume
2-Year	0.68	2309	0.18	696	-73% / -70%
10-Year	1.57	3980	0.60	1384	-62% / -65%
100-Year	1.70	7271	0.84	2796	-51% / -62%

* cfs - cubic feet per second (PROPOSED RUNOFFS DISCARDED)

As shown above, under proposed conditions the proposed peak runoff rates and volumes are less than the existing peak runoff rates and volumes for all the storm events, Also the runoff is being recharged in the land through infiltration fields mostly, giving insignificant runoff to street or neighbors. As such, the proposed site development meets the MADEP Stormwater Management Standard. No adverse impacts to the adjacent waterway or property will occur due to the proposed site development.
No credit is taken for the runoff sent to the three dywells.

Standard No.3 – Groundwater Recharge – *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques stormwater best management practices and good operation & maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions, based on soil types.* -The project site is located within an area of Urban Land (Sandy Loam), which are Hydrologic Soil Groups 'A', (Refer to Soil Data) and are well drained & suited for large volumes of water to be infiltrated. As the site has now large roof structures , recharge is required and with expanded impervious driveway area proposed in this project two large infiltration system are proposed for recharging the increased volume of runoff one for each roof and driveway.
The volume of water needed to be recharged Based on MADEP Stormwater Management Standards, and using the "Simple Dynamic" method of recharge calculation, the required volume to recharge for the site with Hydrologic Soil Group 'A' is as follows:

- Hydrologic Soil Group 'A': 0.60 inches or 0.05 feet of runoff times the total impervious area overlying the on site soils;
- Based on an increased impervious area of 6970 sq. ft., the required recharge volume for the project is 349 cu. ft. of runoff.
- Based on the total impervious area of the site (15,118 sq. ft.), the required recharge volume for the project is 751 cu. ft. of runoff.
  Based on 1" water Quality Recharge Volume of 1,260 cu. ft. is required and is provided in Leaching Field Two for 2 year storm at 1,751cu. ft. with 49% TSS removed in pretreatment before discharge to ground.

The runoff volume that will be stored / infiltrated within the storage / infiltration systems for the two year storm is over 3055 cubic feet of runoff, which far exceeds the minimum requirement for recharge noted above. Based on the SCS soils permeability data, the Loamy Sand and Stratified Gravely soils have a permeability rate of 5 to 99.0 in./hr. The design rate used was 2.4in./hr. as required by the stormwater manual for the Class A soils. Based on a total bottom area of 736 sq. ft., these soils have the capacity to infiltrate approximately 147 cubic feet per hour. At this rate, the total stored volume of runoff in the systems should dissipate within 20 hours after the end of the storm event, which satisfies the MA DEP Requirement of 72 hours.

The depth to EHSW is more than 4 feet (4.5ft+) and therefore mounding calculations are not required.

Standard No.4 – Total Suspended Solids Removal – *The stormwater management system shall be designed to remove 80% of the average annual post-development load of Total Suspended Solids (TSS).* – The runoff volume required under the MADEP Stormwater Guidelines to be treated for water quality purposes, for non-critical areas, is 0.5 inches of runoff times the total impervious area of the post-development project site. As the project results in an overall site impervious area of 15,118 sq. ft., 630 cubic feet is required to be treated to meet this standard. The proposed project provides preliminary treatment via the catchbasins and the drywells/leaching field. The storage volume of the storage / infiltration systems is approximately 2698 cubic feet, which will contain the first flush runoff within the infiltration system. This volume will be slowly infiltrated after the storm event and will provide the needed water quality volume for treatment purposes.

The capture of the first flush of runoff from the site and its subsequent recharge will achieve the 80% TSS removal for the post-development stormwater runoff. Thus the infiltration system provides the 80% removal stipulated. The TSS removal worksheets are attached.

Standard No.5 – Land Uses with Higher Pollutant Loads – *For land uses with higher potential pollutant loads, source controls and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practical.*

This project does not proposes any high polutant load activity being a residential complex. All trash will be located in an enclosed container that will be hauled out on a minimum weekly frequency.

Standard No.6 – Discharge to Critical Areas – *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a Public Water Supply and storrnwater discharges near or to any critical area require the use of the specific source control and pollution prevention measures and the specific structural best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook.*

The project site is not within a Zone II or WPA, nor is the site near to a critical area, as defined by the MADEP.

Standard No.7 – Redevelopment Projects – *A redevelopment project is required to meet the following storrnwater management standards only to the maximum extent possible: Standard 2 & 3, and the pretreatment and structural stormwater best management practice requirements of standards 4, 5 & 6.*
Existing stormwater discharges shall comply with standard 1 only to the maximum extent practical. A redevelopment project shall also comply with all other requirements of the stormwater management standards and improve the existing conditions.

The project is a redevelopment project under these guidelines as a single family home is being replaced with a multi family residence.

Standard No.8 – Construction Related Impacts – *A plan to control construction related impacts, including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation and pollution prevention plan) shall be developed and implemented. -*

The attached Construction Phase Pollution Prevention Plan contains guidelines and procedures to be implemented by the Site Contractor. Erosion and sediment controls will be implemented according to this plan. During construction, no dewatering discharges is anticipated due to topography and location of the land. The site will also be contained within a straw wattle / silt fence erosion control barrier.
The following erosion and sediment control measures will be installed for this project.

- An erosion control barrier, consisting of straw wattles & silt fence will be installed at the limit of work, in the area shown on the drawings.
- A construction entrance will be used to minimize the transport of mud off- site via vehicle tires.
- The only one street catch basin will be provided with runoff filter dam.

- A swale of adequate storage capacity all along the rear slopes will be prepared to contain all the runoff which will infiltrate through it leaching in to the ground leaving behind any fines traveling in to it.

The site Contractor shall be responsible for implementation of the plan, under the supervision of the Applicant and/or their representative.

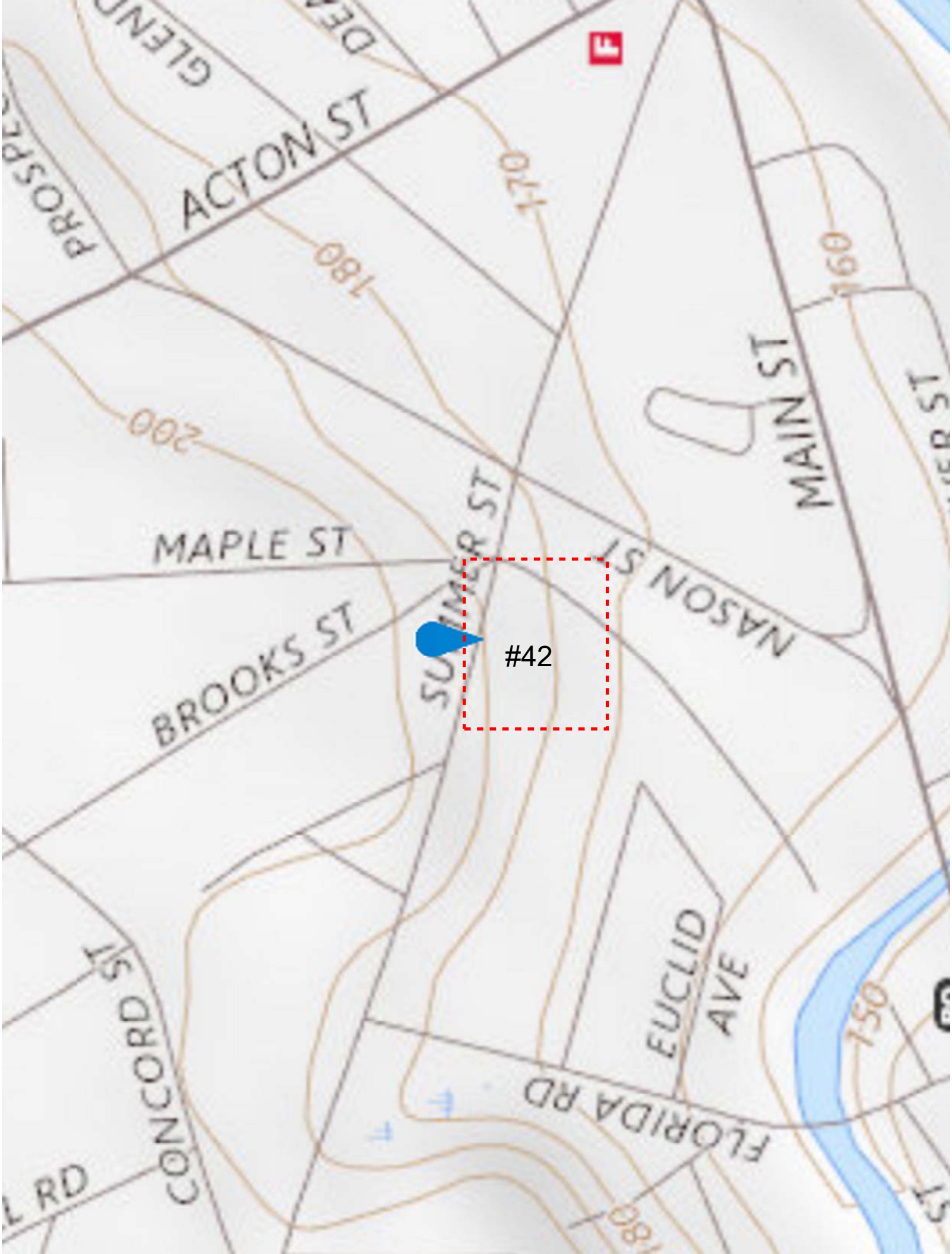
No EPA mandated NPDES Permit is required for this site, as less than one acre of the site will be disturbed. As such, the project does not require a SWPPP.

Standard No.9 – Operation and Maintenance Plan – *A long term operation & maintenance (O&M) plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

A Stormwater Management Plan has been prepared which identifies the Applicant as the party responsible for operation and maintenance during and after construction. It also contains a schedule for inspection and maintenance of stormwater controls and a description of the maintenance tasks to be undertaken. A sample reporting form is included in the plan.

Standard No.10 - Illicit Discharges - *All illicit discharges to the stormwater management systems are prohibited.*

The site has no illicit discharges incorporated into the design or as existing conditions. The use of the site would not generate any illicit discharges.
The Long Term Pollution Prevention Plan will assure that no illicit material enters the system.


ACTON ST
MAPLE ST
BROOKS ST
SUMMER ST
NASON ST
MAIN ST
EUCLID AVE
FLORIDA RD
CONCORD ST
#42

FEMA Flood Map Service Center: Search By Address

Enter an address, place, or coordinates:

42 SUMMER STREET MAYNARD MA

Search

Whether you are in a high risk zone or not, you may need flood insurance (https://www.fema.gov/national-flood-insurance-program) because most homeowners insurance doesn't cover flood damage. If you live in an area with low or moderate flood risk, you are 5 times more likely to experience flood than a fire in your home over the next 30 years. For many, a National Flood Insurance Program's flood insurance policy could cost less than $400 per year. Call your insurance agent today and protect what you've built.

Learn more about steps you can take (https://www.fema.gov/what-mitigation) to reduce flood risk damage.

Search Results—Products for **MAYNARD, TOWN OF**

Show ALL Products » (https://msc.fema.gov/portal/availabilitySearch?addcommunity=250204&communityName=MAYNARD, TOWN OF#searchresu

The flood map for the selected area is number **25017C0362F**, effective on **07/07/2014**

DYNAMIC MAP

PRINT MAP/ FIRMette

MAP IMAGE

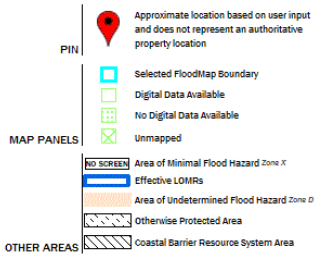
DOWNLOAD FIRM PANEL (https://msc.fema.gov/portal/downloadProduct?filepath=/25/P/Firm/25017C0362F.png&productTypeID=FINAL_PRODUCT&productSubTypeID=FIRM_PANEL&productID=25017C0362

Changes to this FIRM

Revisions (0)
Amendments (1)
Revalidations (1)

You can choose a new flood map or move the location pin by selecting a different location on the locator map below or by entering a new location in the search field above. It may take a minute or more during peak hours to generate a dynamic FIRMette.

Go To NFHL Viewer » (https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd&exten



United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Middlesex County, Massachusetts

42 SUMMER ST MAYNARD MA

April 18, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:482 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 20 40 80 120

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 18, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
602	Urban land	0.6	88.8%
623C	Woodbridge-Urban land complex, 3 to 15 percent slopes	0.1	11.2%
Totals for Area of Interest		**0.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Middlesex County, Massachusetts

602—Urban land

Map Unit Setting

National map unit symbol: 9950
Elevation: 0 to 3,000 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Excavated and filled land

Minor Components

Udorthents, wet substratum

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave

Udorthents, loamy

Percent of map unit: 5 percent
Hydric soil rating: No

623C—Woodbridge-Urban land complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w68b
Elevation: 0 to 550 feet
Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Woodbridge and similar soils: 58 percent
Urban land: 28 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge

Setting

Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 30 inches: fine sandy loam
Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Paxton

Percent of map unit: 9 percent
Landform: Drumlins, ground moraines, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 5 percent
Landform: Drainageways, drumlins, depressions, ground moraines, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

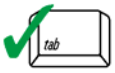
Commonwealth of Massachusetts
City/Town of

Percolation Test

Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Site Information

MACDONALD DEVELOPMENT
Owner Name

42 SUMMER STREET
Street Address or Lot #

MAYNARD	MA	01754
City/Town	State	Zip Code
	781-307-1684	
Contact Person (if different from Owner)	Telephone Number	

B. Test Results

	9-4-18 Date	4:15PM Time	9-4-18 Date	Time
Observation Hole #	1		2	
Depth of Perc	36"			
Start Pre-Soak	4:15			
End Pre-Soak	4:30			
Time at 12”	4:30			
Time at 9”	4:34:30			
Time at 6”	4:40:45			
Time (9”-6”)	0:6:15			
Rate (Min./Inch)	2			
	Test Passed: ☒ Test Failed: ☐		Test Passed: ☐ Test Failed: ☐	

Kanayo Lala (S.E. 1305)
Test Performed By:

Board of Health Witness

Comments:

Perc test and soil evaluation required for roof runoff drainage leaching field

Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

MACDONALD DEVELOPMENT
Owner Name

42 SUMMER STREET
Street Address

014.0-0000-0074.0
Map/Lot #

MAYNARD
City

MA
State

01752
Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair

2. Soil Survey Available? ☒ Yes ☐ No If yes: Soil Web (Source) 602 (Soil Map Unit)

URBAN LAND FORMATION
Soil Name

Soil Limitations

COARSE SANDY GRAVEL WITH STONES
Geologic/Parent Material

DEPRESSIONS, HILLSLOPES/ TOE SLOPES
Landform

3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: 2018 (Year Published/Source) (Publication Scale) 602 (Map Unit)

4. Flood Rate Insurance Map

Above the 500-year flood boundary? ☒ Yes ☐ No
If Yes, continue to #5.

Within the 100-year flood boundary? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No

MassGIS Wetland Data Layer: (Wetland Type)

7. Current Water Resource Conditions (USGS): (Month/Year) Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: 1 | 9-4-18 (Date) | 4.00PM (Time) | SUNNY FALL DAY (Weather)

1. Location

Ground Elevation at Surface of Hole: 181.5+/- feet Latitude/Longitude: 42, 20N/ -71, 27W

Description of Location: 19 FT NORTH OF THE SOUTH PROPERTY

2. Land Use: URBAN GOOD LAWN (e.g., woodland, agricultural field, vacant lot, etc.) | NONE VISIBLE (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 10+/- (Slope (%))

Vegetation | Landform | Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from:

Open Water Body	600FT +/- feet	Drainage Way	feet	Wetlands	feet
Property Line	20+/-FT feet	Drinking Water Well	NONE feet	Other	feet

4. Parent Material: COARSE SANDY GRAVEL Unsuitable Materials Present: ☐ Yes ☒ No

If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: Depth Weeping from Pit | Depth Standing Water in Hole

Estimated Depth to High Groundwater: 120"+ inches 171.5' elevation

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: ONE

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
0-3	A	ASPHALT PAVING									
3-12	B	GARAVEL FILL									
12-96	C	5YR 4/1		NONE		SANDY GRAVEL			FRIABLE	DRY	

Additional Notes:

NO WATER IN THE HOLE FOUND. SEASONAL HIGH WATER TABLE ASSUMED AT DEEPER THAN 10'.

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 2 ____ Date ____ Time ____ Weather

1. Location

   Ground Elevation at Surface of Hole: ____ feet Latitude/Longitude: ____ / ____

2. Land Use ____ (e.g., woodland, agricultural field, vacant lot, etc.) ____ Surface Stones (e.g., cobbles, stones, boulders, etc.) ____ Slope (%)

   ____ Vegetation ____ Landform ____ Position on Landscape (SU, SH, BS, FS,

3. Distances from: Open Water Body ____ feet Drainage Way ____ feet Wetlands ____ feet

   Property Line ____ feet Drinking Water Well ____ feet Other ____ feet

4. Parent Material: ____ Unsuitable Materials Present: ☐ Yes ☐ No

   If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Impervious Layer(s) ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☐ No If yes: ____ Depth Weeping from Pit ____ Depth Standing Water in Hole

   Estimated Depth to High Groundwater: ____ inches ____ elevation

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (continued)

Deep Observation Hole Number: 2

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			

Additional Notes:

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

	Obs. Hole # 1	Obs. Hole #
☐ Depth observed standing water in observation hole	none inches	inches
☐ Depth weeping from side of observation hole	none inches	inches
☐ Depth to soil redoximorphic features (mottles)	NONE inches	inches
☒ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	120"+ inches	inches

Index Well Number _____ Reading Date _____

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole # _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

Obs. Hole # _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

      ☒ Yes ☐ No

   b. If yes, at what depth was it observed? Upper boundary: 12" inches Lower boundary: UNKNOWN inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Board of Health Witness

Name of Board of Health Witness

Board of Health

G. Soil Evaluator Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator

9-4-18
Date

Kanayo Lala, SE1305
Typed or Printed Name of Soil Evaluator / License #

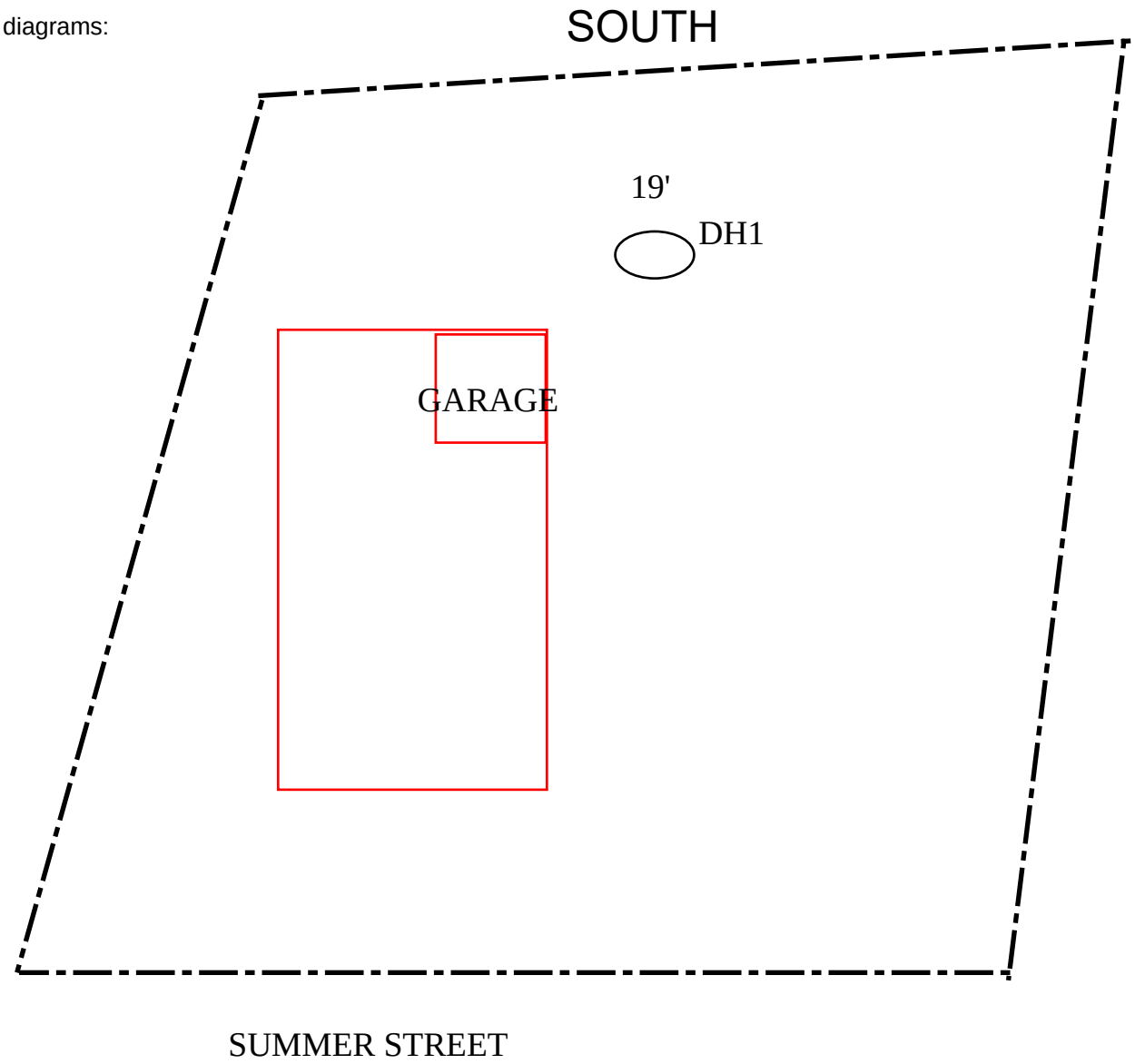
6-30-19
Expiration Date of License

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Commonwealth of Massachusetts
City/Town of
Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Field Diagrams

Use this sheet for field diagrams:



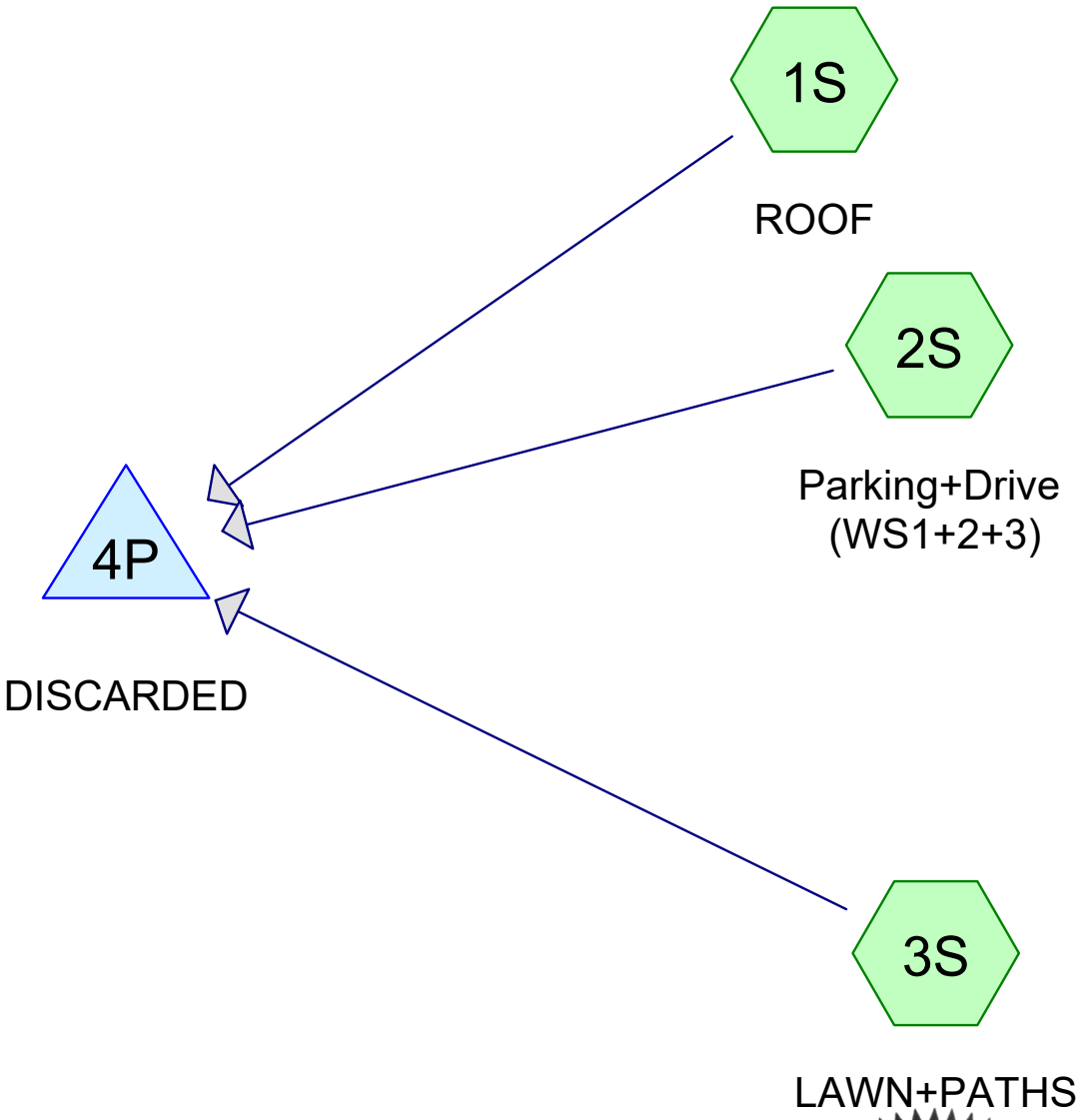
LALA ASSOCIATES ENGINEERS LLC

HYDROCAD REPORTS - PRE DEVELOPMENT

42 SUMMER STREET, MA

PROPOSED CUSTOM HOME

PREPARED BY
Kanayo Lala / Sanjay Kaul
4/18/2019



COMMONWEALTH OF MASSACHUSETTS
SANJAY
KAUL
CIVIL
NO. 40460
REGISTERED
PROFESSIONAL ENGINEER

Subcat Reach Pond Link

Drainage Diagram for MAYNARD-42 SUMMER ST-PRE DEV7 node
Prepared by Kanayo Lala - Printed 9/17/2018

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
12,032	39	>75% Grass cover, Good, HSG A (3S)
8,920	98	Paved parking & roofs (1S, 2S, 3S)
20,952		**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
12,032	HSG A	3S
0	HSG B	
0	HSG C	
0	HSG D	
8,920	Other	1S, 2S, 3S
20,952		**TOTAL AREA**

Summary for Pond 4P: DISCARDED

Inflow Area = 20,952 sf, 42.57% Impervious, Inflow Depth = 1.32" for 2-Year event
Inflow = 0.68 cfs @ 11.98 hrs, Volume= 2,309 cf
Primary = 0.68 cfs @ 11.98 hrs, Volume= 2,309 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs

Summary for Pond 4P: DISCARDED

Inflow Area = 20,952 sf, 42.57% Impervious, Inflow Depth = 2.28" for 10-Year event
Inflow = 1.57 cfs @ 11.84 hrs, Volume= 3,980 cf
Primary = 1.57 cfs @ 11.84 hrs, Volume= 3,980 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs

Summary for Pond 4P: DISCARDED

Inflow Area = 20,952 sf, 42.57% Impervious, Inflow Depth = 2.98" for 25-Year event
Inflow = 1.30 cfs @ 11.98 hrs, Volume= 5,200 cf
Primary = 1.30 cfs @ 11.98 hrs, Volume= 5,200 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs

Summary for Pond 4P: DISCARDED

Inflow Area = 20,952 sf, 42.57% Impervious, Inflow Depth = 4.16" for 100-Year event
Inflow = 1.70 cfs @ 11.98 hrs, Volume= 7,271 cf
Primary = 1.70 cfs @ 11.98 hrs, Volume= 7,271 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs

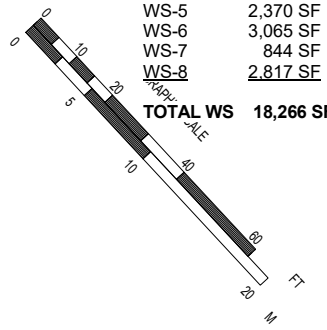
PRE DEVELOPMENT WATERSHEDS

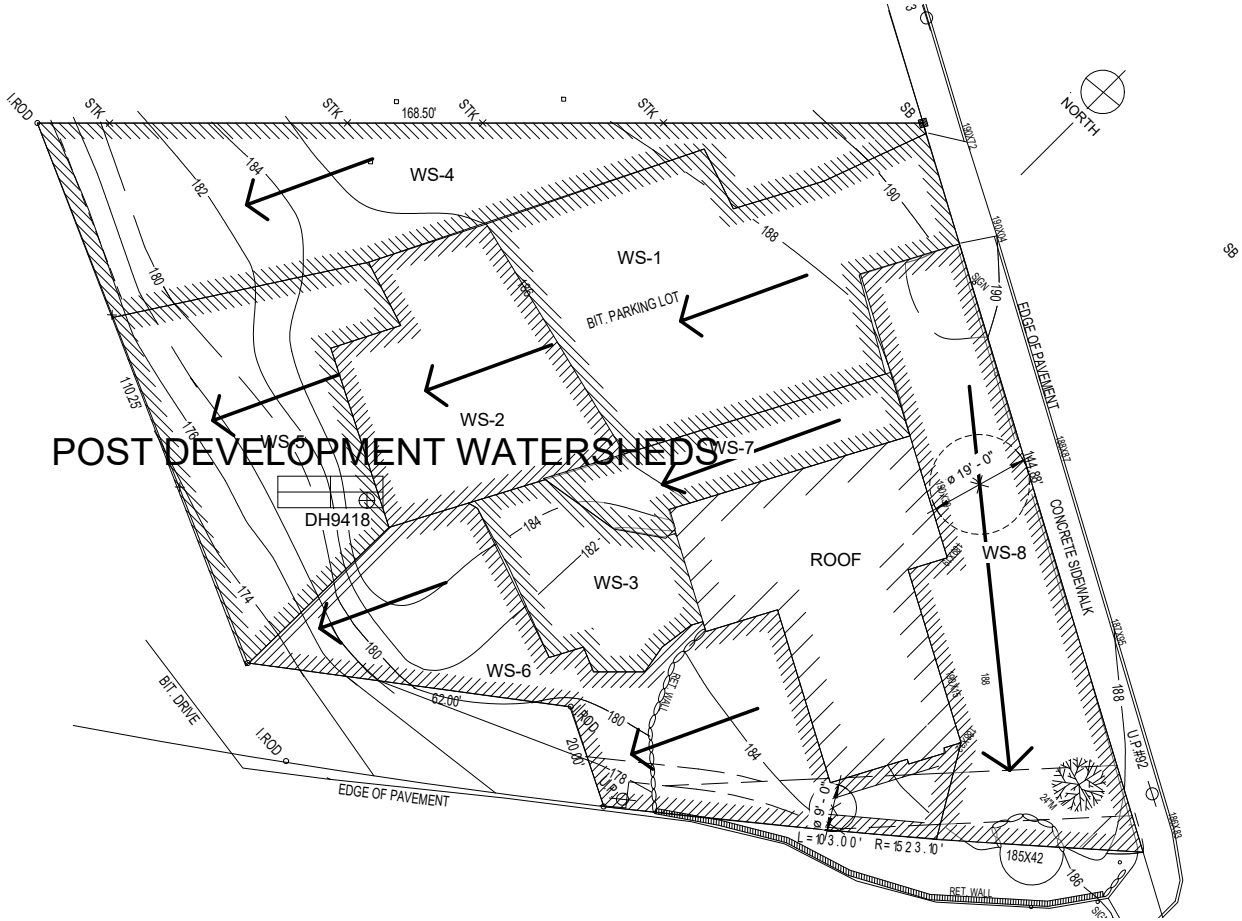
LOT AREA 20,952 SF

GREEN & SIDE WALK
AREA 8,148 SF [0.15]
TOTAL WS 18,266 SF
ROOF AREA 2,686 SF

PAVED AREA 6,082 SF

WS-1	3,131 SF
WS-2	1,868 SF
WS-3	935 SF
WS-4	3,236 SF
WS-5	2,370 SF
WS-6	3,065 SF
WS-7	844 SF
WS-8	2,817 SF
TOTAL WS	**18,266 SF**





POST DEVELOPMENT WATERSHEDS

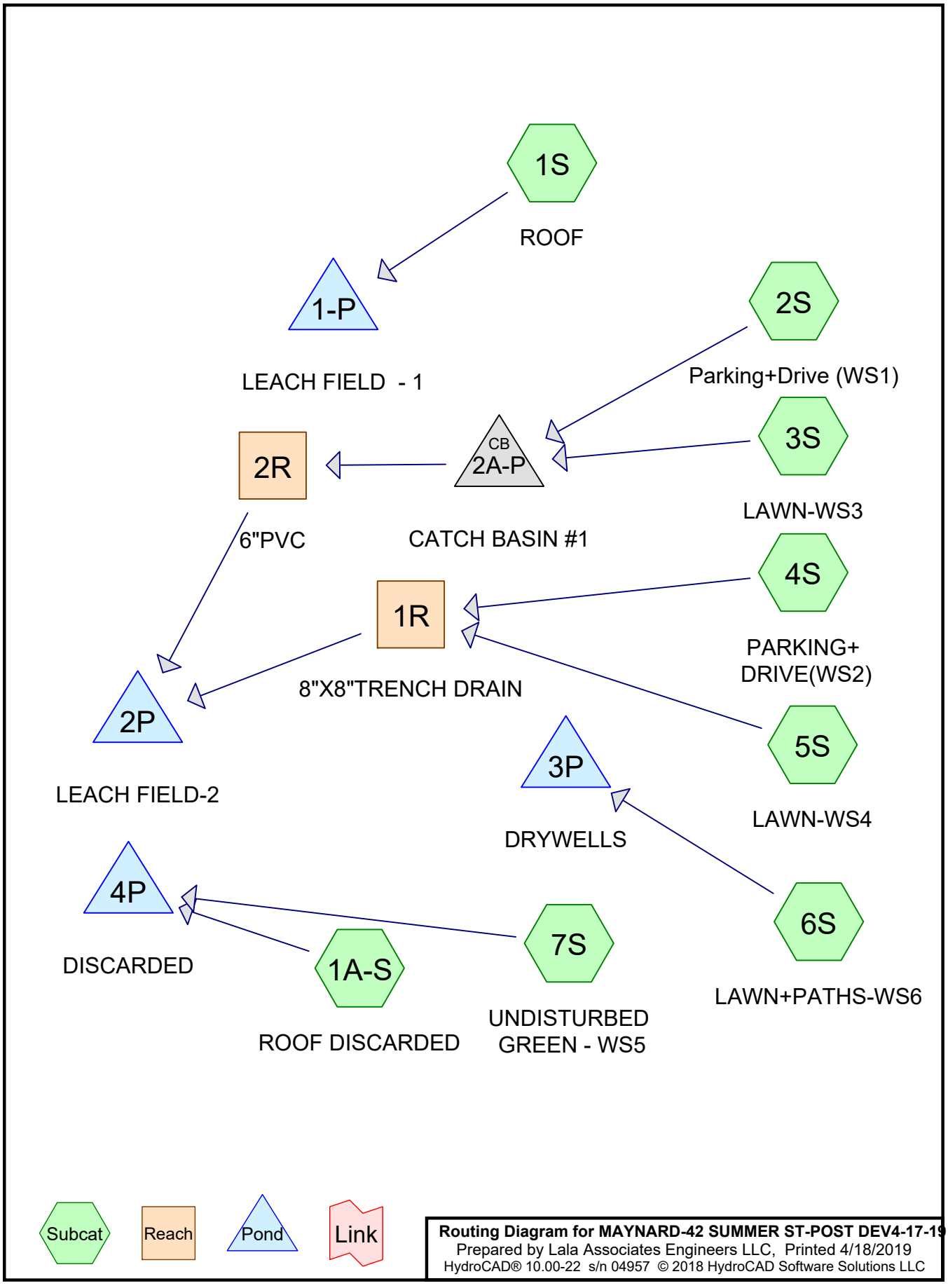
LALA ASSOCIATES ENGINEERS LLC

HYDROCAD REPORTS - POST-DEVELOPMENT

42 SUMMER STREET, MA

PROPOSED CUSTOM HOME

PREPARED BY
Kanayo Lala / Sanjay Kaul
4/18/2019



Routing Diagram for MAYNARD-42 SUMMER ST-POST DEV4-17-19
Prepared by Lala Associates Engineers LLC, Printed 4/18/2019

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
4,950	39	>75% Grass cover, Good, HSG A (3S, 5S, 6S)
14,965	98	Paved parking & roofs (1A-S, 1S, 2S, 4S, 6S)
1,037	32	Woods/grass comb., Good, HSG A (7S)
20,952	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
5,987	HSG A	3S, 5S, 6S, 7S
0	HSG B	
0	HSG C	
0	HSG D	
14,965	Other	1A-S, 1S, 2S, 4S, 6S
20,952		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
4,950	0	0	0	0	4,950	>75% Grass cover, Good	3S, 5S, 6S
0	0	0	0	14,965	14,965	Paved parking & roofs	1A-S, 1S, 2S, 4S, 6S
1,037	0	0	0	0	1,037	Woods/grass comb., Good	7S
5,987	**0**	**0**	**0**	**14,965**	**20,952**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.08 hrs, 376 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A-S: ROOF DISCARDED Runoff Area=2,066 sf 100.00% Impervious Runoff Depth=3.20"
Flow Length=102' Slope=0.0050 '/' Tc=3.5 min CN=98 Runoff=0.16 cfs 550 cf

Subcatchment 1S: ROOF Runoff Area=4,894 sf 100.00% Impervious Runoff Depth=3.20"
Flow Length=102' Slope=0.0050 '/' Tc=3.5 min CN=98 Runoff=0.38 cfs 1,304 cf

Subcatchment 2S: Parking+Drive(WS1) Runoff Area=3,423 sf 100.00% Impervious Runoff Depth=3.20"
Flow Length=103' Tc=1.8 min CN=98 Runoff=0.28 cfs 912 cf

Subcatchment 3S: LAWN-WS3 Runoff Area=481 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=28' Slope=0.0200 '/' Tc=3.4 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment 4S: PARKING+DRIVE(WS2) Runoff Area=3,149 sf 100.00% Impervious Runoff Depth=3.20"
Flow Length=95' Tc=3.9 min CN=98 Runoff=0.24 cfs 839 cf

Subcatchment 5S: LAWN-WS4 Runoff Area=989 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=28' Slope=0.0200 '/' Tc=3.4 min CN=39 Runoff=0.00 cfs 0 cf

Subcatchment 6S: LAWN+PATHS-WS6 Runoff Area=4,913 sf 29.17% Impervious Runoff Depth=0.36"
Flow Length=20' Slope=0.0200 '/' Tc=2.6 min CN=56 Runoff=0.02 cfs 146 cf

Subcatchment 7S: UNDISTURBEDGREEN - WS5 Runoff Area=1,037 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=9' Slope=0.0350 '/' Tc=1.1 min CN=32 Runoff=0.00 cfs 0 cf

Reach 1R: 8"X8"TRENCH DRAIN Avg. Flow Depth=0.13' Max Vel=3.63 fps Inflow=0.24 cfs 839 cf
x 0.75 n=0.010 L=18.0' S=0.0278 '/' Capacity=2.00 cfs Outflow=0.24 cfs 839 cf

Reach 2R: 6"PVC Avg. Flow Depth=0.11' Max Vel=8.42 fps Inflow=0.28 cfs 912 cf
6.0" Round Pipe n=0.010 L=33.0' S=0.1188 '/' Capacity=2.51 cfs Outflow=0.28 cfs 912 cf

Pond 1-P: LEACH FIELD - 1 Peak Elev=183.88' Storage=469 cf Inflow=0.38 cfs 1,304 cf
Discarded=0.04 cfs 1,304 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 1,304 cf

Pond 2A-P: CATCH BASIN #1 Peak Elev=185.34' Inflow=0.28 cfs 912 cf
Outflow=0.28 cfs 912 cf

Pond 2P: LEACH FIELD-2 Peak Elev=179.41' Storage=674 cf Inflow=0.51 cfs 1,751 cf
Discarded=0.06 cfs 1,751 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 1,751 cf

Pond 3P: DRYWELLS Peak Elev=176.27' Storage=17 cf Inflow=0.02 cfs 146 cf
Discarded=0.01 cfs 146 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 146 cf

Pond 4P: DISCARDED Inflow=0.16 cfs 550 cf
Primary=0.16 cfs 550 cf

Total Runoff Area = 20,952 sf Runoff Volume = 3,751 cf Average Runoff Depth = 2.15"
28.57% Pervious = 5,987 sf 71.43% Impervious = 14,965 sf

Summary for Subcatchment 1A-S: ROOF DISCARDED

Runoff = 0.16 cfs @ 12.01 hrs, Volume= 550 cf, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 2-Year Rainfall=3.43"

Area (sf)	CN	Description
2,066	98	Paved parking & roofs
2,066		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	32	0.0050	0.65		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
0.3	35	0.0050	2.11	0.29	**Pipe Channel, gutter** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.011 Steel, smooth
2.4	35	0.0050	0.24	0.05	**Pipe Channel, Drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.110
3.5	102	Total			

Hydrograph for Subcatchment 1A-S: ROOF DISCARDED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.01	0.00	0.00
0.80	0.03	0.00	0.00
1.20	0.04	0.00	0.00
1.60	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.40	0.08	0.01	0.00
2.80	0.10	0.01	0.00
3.20	0.11	0.02	0.00
3.60	0.13	0.03	0.00
4.00	0.15	0.04	0.00
4.40	0.17	0.05	0.00
4.80	0.18	0.06	0.00
5.20	0.20	0.07	0.00
5.60	0.23	0.09	0.00
6.00	0.25	0.10	0.00
6.40	0.27	0.12	0.00
6.80	0.30	0.14	0.00
7.20	0.33	0.17	0.00
7.60	0.36	0.19	0.00
8.00	0.39	0.22	0.00
8.40	0.43	0.26	0.00
8.80	0.47	0.30	0.01
9.20	0.53	0.34	0.01
9.60	0.58	0.40	0.01
10.00	0.65	0.45	0.01
10.40	0.72	0.52	0.01
10.80	0.81	0.61	0.01
11.20	0.91	0.71	0.01
11.60	1.08	0.87	0.03
12.00	1.71	1.49	**0.16**
12.40	2.35	2.12	0.04
12.80	2.52	2.29	0.02
13.20	2.62	2.39	0.01
13.60	2.71	2.48	0.01
14.00	2.78	2.55	0.01
14.40	2.85	2.61	0.01
14.80	2.90	2.67	0.01
15.20	2.96	2.72	0.01
15.60	3.00	2.77	0.01
16.00	3.04	2.81	0.00
16.40	3.07	2.84	0.00
16.80	3.10	2.87	0.00
17.20	3.13	2.90	0.00
17.60	3.16	2.93	0.00
18.00	3.18	2.95	0.00
18.40	3.20	2.97	0.00
18.80	3.23	2.99	0.00
19.20	3.25	3.01	0.00
19.60	3.26	3.03	0.00
20.00	3.28	3.05	0.00
20.40	3.30	3.07	0.00
20.80	3.32	3.08	0.00
21.20	3.33	3.10	0.00
21.60	3.35	3.12	0.00
22.00	3.36	3.13	0.00
22.40	3.38	3.15	0.00
22.80	3.39	3.16	0.00
23.20	3.41	3.17	0.00
23.60	3.42	3.18	0.00
24.00	**3.43**	**3.20**	0.00
24.40	3.43	3.20	0.00
24.80	3.43	3.20	0.00
25.20	3.43	3.20	0.00
25.60	3.43	3.20	0.00
26.00	3.43	3.20	0.00
26.40	3.43	3.20	0.00
26.80	3.43	3.20	0.00
27.20	3.43	3.20	0.00
27.60	3.43	3.20	0.00
28.00	3.43	3.20	0.00
28.40	3.43	3.20	0.00
28.80	3.43	3.20	0.00
29.20	3.43	3.20	0.00
29.60	3.43	3.20	0.00
30.00	3.43	3.20	0.00

Summary for Subcatchment 1S: ROOF

Runoff = 0.38 cfs @ 12.01 hrs, Volume= 1,304 cf, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 2-Year Rainfall=3.43"

Area (sf)	CN	Description
4,894	98	Paved parking & roofs
4,894		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	32	0.0050	0.65		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
0.3	35	0.0050	2.11	0.29	**Pipe Channel, gutter** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.011 Steel, smooth
2.4	35	0.0050	0.24	0.05	**Pipe Channel, Drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.110
3.5	102	Total			

Hydrograph for Subcatchment 1S: ROOF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.01	0.00	0.00
0.80	0.03	0.00	0.00
1.20	0.04	0.00	0.00
1.60	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.40	0.08	0.01	0.00
2.80	0.10	0.01	0.00
3.20	0.11	0.02	0.00
3.60	0.13	0.03	0.00
4.00	0.15	0.04	0.00
4.40	0.17	0.05	0.00
4.80	0.18	0.06	0.00
5.20	0.20	0.07	0.00
5.60	0.23	0.09	0.00
6.00	0.25	0.10	0.00
6.40	0.27	0.12	0.01
6.80	0.30	0.14	0.01
7.20	0.33	0.17	0.01
7.60	0.36	0.19	0.01
8.00	0.39	0.22	0.01
8.40	0.43	0.26	0.01
8.80	0.47	0.30	0.01
9.20	0.53	0.34	0.01
9.60	0.58	0.40	0.02
10.00	0.65	0.45	0.02
10.40	0.72	0.52	0.02
10.80	0.81	0.61	0.03
11.20	0.91	0.71	0.03
11.60	1.08	0.87	0.07
12.00	1.71	1.49	**0.38**
12.40	2.35	2.12	0.08
12.80	2.52	2.29	0.04
13.20	2.62	2.39	0.03
13.60	2.71	2.48	0.02
14.00	2.78	2.55	0.02
14.40	2.85	2.61	0.02
14.80	2.90	2.67	0.02
15.20	2.96	2.72	0.01
15.60	3.00	2.77	0.01
16.00	3.04	2.81	0.01
16.40	3.07	2.84	0.01
16.80	3.10	2.87	0.01
17.20	3.13	2.90	0.01
17.60	3.16	2.93	0.01
18.00	3.18	2.95	0.01
18.40	3.20	2.97	0.01
18.80	3.23	2.99	0.01
19.20	3.25	3.01	0.01
19.60	3.26	3.03	0.01
20.00	3.28	3.05	0.01
20.40	3.30	3.07	0.00
20.80	3.32	3.08	0.00
21.20	3.33	3.10	0.00
21.60	3.35	3.12	0.00
22.00	3.36	3.13	0.00
22.40	3.38	3.15	0.00
22.80	3.39	3.16	0.00
23.20	3.41	3.17	0.00
23.60	3.42	3.18	0.00
24.00	**3.43**	**3.20**	0.00
24.40	3.43	3.20	0.00
24.80	3.43	3.20	0.00
25.20	3.43	3.20	0.00
25.60	3.43	3.20	0.00
26.00	3.43	3.20	0.00
26.40	3.43	3.20	0.00
26.80	3.43	3.20	0.00
27.20	3.43	3.20	0.00
27.60	3.43	3.20	0.00
28.00	3.43	3.20	0.00
28.40	3.43	3.20	0.00
28.80	3.43	3.20	0.00
29.20	3.43	3.20	0.00
29.60	3.43	3.20	0.00
30.00	3.43	3.20	0.00

Summary for Subcatchment 2S: Parking+Drive (WS1)

Runoff = 0.28 cfs @ 11.99 hrs, Volume= 912 cf, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 2-Year Rainfall=3.43"

Area (sf)	CN	Description
3,423	98	Paved parking & roofs
3,423		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	70	0.0350	1.65		**Sheet Flow, Paved Area** Smooth surfaces n= 0.011 P2= 3.40"
1.1	33	0.1700	0.50	0.01	**Pipe Channel, Drain** 6.0" Round w/ 5.0" inside fill Area= 0.0 sf Perim= 0.8' r= 0.03' n= 0.110
1.8	103	Total			

Hydrograph for Subcatchment 2S: Parking+Drive (WS1)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.01	0.00	0.00
0.80	0.03	0.00	0.00
1.20	0.04	0.00	0.00
1.60	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.40	0.08	0.01	0.00
2.80	0.10	0.01	0.00
3.20	0.11	0.02	0.00
3.60	0.13	0.03	0.00
4.00	0.15	0.04	0.00
4.40	0.17	0.05	0.00
4.80	0.18	0.06	0.00
5.20	0.20	0.07	0.00
5.60	0.23	0.09	0.00
6.00	0.25	0.10	0.00
6.40	0.27	0.12	0.00
6.80	0.30	0.14	0.00
7.20	0.33	0.17	0.00
7.60	0.36	0.19	0.01
8.00	0.39	0.22	0.01
8.40	0.43	0.26	0.01
8.80	0.47	0.30	0.01
9.20	0.53	0.34	0.01
9.60	0.58	0.40	0.01
10.00	0.65	0.45	0.01
10.40	0.72	0.52	0.02
10.80	0.81	0.61	0.02
11.20	0.91	0.71	0.02
11.60	1.08	0.87	0.06
12.00	1.71	1.49	**0.28**
12.40	2.35	2.12	0.05
12.80	2.52	2.29	0.02
13.20	2.62	2.39	0.02
13.60	2.71	2.48	0.02
14.00	2.78	2.55	0.01
14.40	2.85	2.61	0.01
14.80	2.90	2.67	0.01
15.20	2.96	2.72	0.01
15.60	3.00	2.77	0.01
16.00	3.04	2.81	0.01
16.40	3.07	2.84	0.01
16.80	3.10	2.87	0.01
17.20	3.13	2.90	0.01
17.60	3.16	2.93	0.00
18.00	3.18	2.95	0.00
18.40	3.20	2.97	0.00
18.80	3.23	2.99	0.00
19.20	3.25	3.01	0.00
19.60	3.26	3.03	0.00
20.00	3.28	3.05	0.00
20.40	3.30	3.07	0.00
20.80	3.32	3.08	0.00
21.20	3.33	3.10	0.00
21.60	3.35	3.12	0.00
22.00	3.36	3.13	0.00
22.40	3.38	3.15	0.00
22.80	3.39	3.16	0.00
23.20	3.41	3.17	0.00
23.60	3.42	3.18	0.00
24.00	**3.43**	**3.20**	0.00
24.40	3.43	3.20	0.00
24.80	3.43	3.20	0.00
25.20	3.43	3.20	0.00
25.60	3.43	3.20	0.00
26.00	3.43	3.20	0.00
26.40	3.43	3.20	0.00
26.80	3.43	3.20	0.00
27.20	3.43	3.20	0.00
27.60	3.43	3.20	0.00
28.00	3.43	3.20	0.00
28.40	3.43	3.20	0.00
28.80	3.43	3.20	0.00
29.20	3.43	3.20	0.00
29.60	3.43	3.20	0.00
30.00	3.43	3.20	0.00

Summary for Subcatchment 3S: LAWN-WS3

Runoff = 0.00 cfs @ 23.06 hrs, Volume= 0 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 2-Year Rainfall=3.43"

Area (sf)	CN	Description
481	39	>75% Grass cover, Good, HSG A
481		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	28	0.0200	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 3S: LAWN-WS3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.01	0.00	0.00
0.80	0.03	0.00	0.00
1.20	0.04	0.00	0.00
1.60	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.40	0.08	0.00	0.00
2.80	0.10	0.00	0.00
3.20	0.11	0.00	0.00
3.60	0.13	0.00	0.00
4.00	0.15	0.00	0.00
4.40	0.17	0.00	0.00
4.80	0.18	0.00	0.00
5.20	0.20	0.00	0.00
5.60	0.23	0.00	0.00
6.00	0.25	0.00	0.00
6.40	0.27	0.00	0.00
6.80	0.30	0.00	0.00
7.20	0.33	0.00	0.00
7.60	0.36	0.00	0.00
8.00	0.39	0.00	0.00
8.40	0.43	0.00	0.00
8.80	0.47	0.00	0.00
9.20	0.53	0.00	0.00
9.60	0.58	0.00	0.00
10.00	0.65	0.00	0.00
10.40	0.72	0.00	0.00
10.80	0.81	0.00	0.00
11.20	0.91	0.00	0.00
11.60	1.08	0.00	0.00
12.00	1.71	0.00	0.00
12.40	2.35	0.00	0.00
12.80	2.52	0.00	0.00
13.20	2.62	0.00	0.00
13.60	2.71	0.00	0.00
14.00	2.78	0.00	0.00
14.40	2.85	0.00	0.00
14.80	2.90	0.00	0.00
15.20	2.96	0.00	0.00
15.60	3.00	0.00	0.00
16.00	3.04	0.00	0.00
16.40	3.07	0.00	0.00
16.80	3.10	0.00	0.00
17.20	3.13	0.00	0.00
17.60	3.16	0.00	0.00
18.00	3.18	0.00	0.00
18.40	3.20	0.00	0.00
18.80	3.23	0.00	0.00
19.20	3.25	0.00	0.00
19.60	3.26	0.00	0.00
20.00	3.28	0.00	0.00
20.40	3.30	0.00	0.00
20.80	3.32	0.00	0.00
21.20	3.33	0.00	0.00
21.60	3.35	0.00	0.00
22.00	3.36	0.00	0.00
22.40	3.38	0.00	0.00
22.80	3.39	0.00	**0.00**
23.20	3.41	0.00	**0.00**
23.60	3.42	0.01	0.00
24.00	**3.43**	**0.01**	0.00
24.40	3.43	0.01	0.00
24.80	3.43	0.01	0.00
25.20	3.43	0.01	0.00
25.60	3.43	0.01	0.00
26.00	3.43	0.01	0.00
26.40	3.43	0.01	0.00
26.80	3.43	0.01	0.00
27.20	3.43	0.01	0.00
27.60	3.43	0.01	0.00
28.00	3.43	0.01	0.00
28.40	3.43	0.01	0.00
28.80	3.43	0.01	0.00
29.20	3.43	0.01	0.00
29.60	3.43	0.01	0.00
30.00	3.43	0.01	0.00

Summary for Subcatchment 4S: PARKING+ DRIVE(WS2)

Runoff = 0.24 cfs @ 12.01 hrs, Volume= 839 cf, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 2-Year Rainfall=3.43"

Area (sf)	CN	Description
3,149	98	Paved parking & roofs
3,149		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	70	0.0700	2.18		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
3.4	25	0.0100	0.12	0.00	**Pipe Channel, Drain** 6.0" Round w/ 5.0" inside fill Area= 0.0 sf Perim= 0.8' r= 0.03' n= 0.110
3.9	95	Total			

Hydrograph for Subcatchment 4S: PARKING+ DRIVE(WS2)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.01	0.00	0.00
0.80	0.03	0.00	0.00
1.20	0.04	0.00	0.00
1.60	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.40	0.08	0.01	0.00
2.80	0.10	0.01	0.00
3.20	0.11	0.02	0.00
3.60	0.13	0.03	0.00
4.00	0.15	0.04	0.00
4.40	0.17	0.05	0.00
4.80	0.18	0.06	0.00
5.20	0.20	0.07	0.00
5.60	0.23	0.09	0.00
6.00	0.25	0.10	0.00
6.40	0.27	0.12	0.00
6.80	0.30	0.14	0.00
7.20	0.33	0.17	0.00
7.60	0.36	0.19	0.01
8.00	0.39	0.22	0.01
8.40	0.43	0.26	0.01
8.80	0.47	0.30	0.01
9.20	0.53	0.34	0.01
9.60	0.58	0.40	0.01
10.00	0.65	0.45	0.01
10.40	0.72	0.52	0.01
10.80	0.81	0.61	0.02
11.20	0.91	0.71	0.02
11.60	1.08	0.87	0.05
12.00	1.71	1.49	**0.24**
12.40	2.35	2.12	0.06
12.80	2.52	2.29	0.02
13.20	2.62	2.39	0.02
13.60	2.71	2.48	0.01
14.00	2.78	2.55	0.01
14.40	2.85	2.61	0.01
14.80	2.90	2.67	0.01
15.20	2.96	2.72	0.01
15.60	3.00	2.77	0.01
16.00	3.04	2.81	0.01
16.40	3.07	2.84	0.01
16.80	3.10	2.87	0.01
17.20	3.13	2.90	0.01
17.60	3.16	2.93	0.00
18.00	3.18	2.95	0.00
18.40	3.20	2.97	0.00
18.80	3.23	2.99	0.00
19.20	3.25	3.01	0.00
19.60	3.26	3.03	0.00
20.00	3.28	3.05	0.00
20.40	3.30	3.07	0.00
20.80	3.32	3.08	0.00
21.20	3.33	3.10	0.00
21.60	3.35	3.12	0.00
22.00	3.36	3.13	0.00
22.40	3.38	3.15	0.00
22.80	3.39	3.16	0.00
23.20	3.41	3.17	0.00
23.60	3.42	3.18	0.00
24.00	**3.43**	**3.20**	0.00
24.40	3.43	3.20	0.00
24.80	3.43	3.20	0.00
25.20	3.43	3.20	0.00
25.60	3.43	3.20	0.00
26.00	3.43	3.20	0.00
26.40	3.43	3.20	0.00
26.80	3.43	3.20	0.00
27.20	3.43	3.20	0.00
27.60	3.43	3.20	0.00
28.00	3.43	3.20	0.00
28.40	3.43	3.20	0.00
28.80	3.43	3.20	0.00
29.20	3.43	3.20	0.00
29.60	3.43	3.20	0.00
30.00	3.43	3.20	0.00

Summary for Subcatchment 5S: LAWN-WS4

Runoff = 0.00 cfs @ 23.06 hrs, Volume= 0 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 2-Year Rainfall=3.43"

Area (sf)	CN	Description
989	39	>75% Grass cover, Good, HSG A
989		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	28	0.0200	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 5S: LAWN-WS4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.01	0.00	0.00
0.80	0.03	0.00	0.00
1.20	0.04	0.00	0.00
1.60	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.40	0.08	0.00	0.00
2.80	0.10	0.00	0.00
3.20	0.11	0.00	0.00
3.60	0.13	0.00	0.00
4.00	0.15	0.00	0.00
4.40	0.17	0.00	0.00
4.80	0.18	0.00	0.00
5.20	0.20	0.00	0.00
5.60	0.23	0.00	0.00
6.00	0.25	0.00	0.00
6.40	0.27	0.00	0.00
6.80	0.30	0.00	0.00
7.20	0.33	0.00	0.00
7.60	0.36	0.00	0.00
8.00	0.39	0.00	0.00
8.40	0.43	0.00	0.00
8.80	0.47	0.00	0.00
9.20	0.53	0.00	0.00
9.60	0.58	0.00	0.00
10.00	0.65	0.00	0.00
10.40	0.72	0.00	0.00
10.80	0.81	0.00	0.00
11.20	0.91	0.00	0.00
11.60	1.08	0.00	0.00
12.00	1.71	0.00	0.00
12.40	2.35	0.00	0.00
12.80	2.52	0.00	0.00
13.20	2.62	0.00	0.00
13.60	2.71	0.00	0.00
14.00	2.78	0.00	0.00
14.40	2.85	0.00	0.00
14.80	2.90	0.00	0.00
15.20	2.96	0.00	0.00
15.60	3.00	0.00	0.00
16.00	3.04	0.00	0.00
16.40	3.07	0.00	0.00
16.80	3.10	0.00	0.00
17.20	3.13	0.00	0.00
17.60	3.16	0.00	0.00
18.00	3.18	0.00	0.00
18.40	3.20	0.00	0.00
18.80	3.23	0.00	0.00
19.20	3.25	0.00	0.00
19.60	3.26	0.00	0.00
20.00	3.28	0.00	0.00
20.40	3.30	0.00	0.00
20.80	3.32	0.00	0.00
21.20	3.33	0.00	0.00
21.60	3.35	0.00	0.00
22.00	3.36	0.00	0.00
22.40	3.38	0.00	0.00
22.80	3.39	0.00	**0.00**
23.20	3.41	0.00	**0.00**
23.60	3.42	0.01	0.00
24.00	**3.43**	**0.01**	0.00
24.40	3.43	0.01	0.00
24.80	3.43	0.01	0.00
25.20	3.43	0.01	0.00
25.60	3.43	0.01	0.00
26.00	3.43	0.01	0.00
26.40	3.43	0.01	0.00
26.80	3.43	0.01	0.00
27.20	3.43	0.01	0.00
27.60	3.43	0.01	0.00
28.00	3.43	0.01	0.00
28.40	3.43	0.01	0.00
28.80	3.43	0.01	0.00
29.20	3.43	0.01	0.00
29.60	3.43	0.01	0.00
30.00	3.43	0.01	0.00

Summary for Subcatchment 6S: LAWN+PATHS-WS6

Runoff = 0.02 cfs @ 12.10 hrs, Volume= 146 cf, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 2-Year Rainfall=3.43"

Area (sf)	CN	Description
3,480	39	>75% Grass cover, Good, HSG A
1,433	98	Paved parking & roofs
4,913	56	Weighted Average
3,480		70.83% Pervious Area
1,433		29.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	20	0.0200	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 6S: LAWN+PATHS-WS6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.01	0.00	0.00
0.80	0.03	0.00	0.00
1.20	0.04	0.00	0.00
1.60	0.05	0.00	0.00
2.00	0.07	0.00	0.00
2.40	0.08	0.00	0.00
2.80	0.10	0.00	0.00
3.20	0.11	0.00	0.00
3.60	0.13	0.00	0.00
4.00	0.15	0.00	0.00
4.40	0.17	0.00	0.00
4.80	0.18	0.00	0.00
5.20	0.20	0.00	0.00
5.60	0.23	0.00	0.00
6.00	0.25	0.00	0.00
6.40	0.27	0.00	0.00
6.80	0.30	0.00	0.00
7.20	0.33	0.00	0.00
7.60	0.36	0.00	0.00
8.00	0.39	0.00	0.00
8.40	0.43	0.00	0.00
8.80	0.47	0.00	0.00
9.20	0.53	0.00	0.00
9.60	0.58	0.00	0.00
10.00	0.65	0.00	0.00
10.40	0.72	0.00	0.00
10.80	0.81	0.00	0.00
11.20	0.91	0.00	0.00
11.60	1.08	0.00	0.00
12.00	1.71	0.00	**0.01**
12.40	2.35	0.07	**0.01**
12.80	2.52	0.10	0.01
13.20	2.62	0.12	0.01
13.60	2.71	0.14	0.01
14.00	2.78	0.16	0.00
14.40	2.85	0.18	0.00
14.80	2.90	0.19	0.00
15.20	2.96	0.21	0.00
15.60	3.00	0.22	0.00
16.00	3.04	0.23	0.00
16.40	3.07	0.24	0.00
16.80	3.10	0.25	0.00
17.20	3.13	0.26	0.00
17.60	3.16	0.27	0.00
18.00	3.18	0.27	0.00
18.40	3.20	0.28	0.00
18.80	3.23	0.29	0.00
19.20	3.25	0.29	0.00
19.60	3.26	0.30	0.00
20.00	3.28	0.31	0.00
20.40	3.30	0.31	0.00
20.80	3.32	0.32	0.00
21.20	3.33	0.32	0.00
21.60	3.35	0.33	0.00
22.00	3.36	0.33	0.00
22.40	3.38	0.34	0.00
22.80	3.39	0.34	0.00
23.20	3.41	0.35	0.00
23.60	3.42	0.35	0.00
24.00	**3.43**	**0.36**	0.00
24.40	3.43	0.36	0.00
24.80	3.43	0.36	0.00
25.20	3.43	0.36	0.00
25.60	3.43	0.36	0.00
26.00	3.43	0.36	0.00
26.40	3.43	0.36	0.00
26.80	3.43	0.36	0.00
27.20	3.43	0.36	0.00
27.60	3.43	0.36	0.00
28.00	3.43	0.36	0.00
28.40	3.43	0.36	0.00
28.80	3.43	0.36	0.00
29.20	3.43	0.36	0.00
29.60	3.43	0.36	0.00
30.00	3.43	0.36	0.00

Summary for Subcatchment 7S: UNDISTURBED GREEN - WS5

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 2-Year Rainfall=3.43"

Area (sf)	CN	Description
1,037	32	Woods/grass comb., Good, HSG A
1,037		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	9	0.0350	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 7S: UNDISTURBED GREEN - WS5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	**0.00**	**0.00**	21.20	3.33	0.00	0.00
0.40	0.01	0.00	0.00	21.60	3.35	0.00	0.00
0.80	0.03	0.00	0.00	22.00	3.36	0.00	0.00
1.20	0.04	0.00	0.00	22.40	3.38	0.00	0.00
1.60	0.05	0.00	0.00	22.80	3.39	0.00	0.00
2.00	0.07	0.00	0.00	23.20	3.41	0.00	0.00
2.40	0.08	0.00	0.00	23.60	3.42	0.00	0.00
2.80	0.10	0.00	0.00	24.00	**3.43**	0.00	0.00
3.20	0.11	0.00	0.00	24.40	3.43	0.00	0.00
3.60	0.13	0.00	0.00	24.80	3.43	0.00	0.00
4.00	0.15	0.00	0.00	25.20	3.43	0.00	0.00
4.40	0.17	0.00	0.00	25.60	3.43	0.00	0.00
4.80	0.18	0.00	0.00	26.00	3.43	0.00	0.00
5.20	0.20	0.00	0.00	26.40	3.43	0.00	0.00
5.60	0.23	0.00	0.00	26.80	3.43	0.00	0.00
6.00	0.25	0.00	0.00	27.20	3.43	0.00	0.00
6.40	0.27	0.00	0.00	27.60	3.43	0.00	0.00
6.80	0.30	0.00	0.00	28.00	3.43	0.00	0.00
7.20	0.33	0.00	0.00	28.40	3.43	0.00	0.00
7.60	0.36	0.00	0.00	28.80	3.43	0.00	0.00
8.00	0.39	0.00	0.00	29.20	3.43	0.00	0.00
8.40	0.43	0.00	0.00	29.60	3.43	0.00	0.00
8.80	0.47	0.00	0.00	30.00	3.43	0.00	0.00
9.20	0.53	0.00	0.00				
9.60	0.58	0.00	0.00				
10.00	0.65	0.00	0.00				
10.40	0.72	0.00	0.00				
10.80	0.81	0.00	0.00				
11.20	0.91	0.00	0.00				
11.60	1.08	0.00	0.00				
12.00	1.71	0.00	0.00				
12.40	2.35	0.00	0.00				
12.80	2.52	0.00	0.00				
13.20	2.62	0.00	0.00				
13.60	2.71	0.00	0.00				
14.00	2.78	0.00	0.00				
14.40	2.85	0.00	0.00				
14.80	2.90	0.00	0.00				
15.20	2.96	0.00	0.00				
15.60	3.00	0.00	0.00				
16.00	3.04	0.00	0.00				
16.40	3.07	0.00	0.00				
16.80	3.10	0.00	0.00				
17.20	3.13	0.00	0.00				
17.60	3.16	0.00	0.00				
18.00	3.18	0.00	0.00				
18.40	3.20	0.00	0.00				
18.80	3.23	0.00	0.00				
19.20	3.25	0.00	0.00				
19.60	3.26	0.00	0.00				
20.00	3.28	0.00	0.00				
20.40	3.30	0.00	0.00				
20.80	3.32	0.00	0.00				

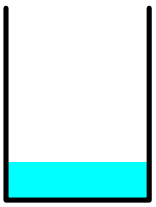
Summary for Reach 1R: 8"X8"TRENCH DRAIN

Inflow Area = 4,138 sf, 76.10% Impervious, Inflow Depth = 2.43" for 2-Year event
Inflow = 0.24 cfs @ 12.01 hrs, Volume= 839 cf
Outflow = 0.24 cfs @ 12.01 hrs, Volume= 839 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Max. Velocity= 3.63 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 0.3 min

Peak Storage= 1 cf @ 12.01 hrs
Average Depth at Peak Storage= 0.13'
Defined Flood Depth= 183.00' Flow Area= 91.5 sf, Capacity= 644.29 cfs
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.00 cfs

A factor of 0.75 has been applied to the discharge capacity and velocity
0.50' x 0.67' deep channel, n= 0.010 PVC, smooth interior
Length= 18.0' Slope= 0.0278 '/'
Inlet Invert= 180.33', Outlet Invert= 179.83'



THE TRENCH DRAIN WILL HAVE A SUMP OF 2" DEPTH TO SEPARATE ANY SOLIDS.

FLOW CALCULATIONS ARE FOR A 6" OPENING TO THE TRENCH.

Hydrograph for Reach 1R: 8"X8"TRENCH DRAIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	180.33	0.00
0.80	0.00	0	180.33	0.00
1.60	0.00	0	180.33	0.00
2.40	0.00	0	180.33	0.00
3.20	0.00	0	180.33	0.00
4.00	0.00	0	180.34	0.00
4.80	0.00	0	180.34	0.00
5.60	0.00	0	180.34	0.00
6.40	0.00	0	180.34	0.00
7.20	0.00	0	180.34	0.00
8.00	0.01	0	180.34	0.01
8.80	0.01	0	180.34	0.01
9.60	0.01	0	180.35	0.01
10.40	0.01	0	180.35	0.01
11.20	0.02	0	180.36	0.02
12.00	**0.24**	**1**	**180.46**	**0.24**
12.80	0.02	0	180.36	0.02
13.60	0.01	0	180.35	0.01
14.40	0.01	0	180.35	0.01
15.20	0.01	0	180.35	0.01
16.00	0.01	0	180.34	0.01
16.80	0.01	0	180.34	0.01
17.60	0.00	0	180.34	0.00
18.40	0.00	0	180.34	0.00
19.20	0.00	0	180.34	0.00
20.00	0.00	0	180.34	0.00
20.80	0.00	0	180.34	0.00
21.60	0.00	0	180.34	0.00
22.40	0.00	0	180.34	0.00
23.20	0.00	0	180.34	0.00
24.00	0.00	0	180.33	0.00
24.80	0.00	0	180.33	0.00
25.60	0.00	0	180.33	0.00
26.40	0.00	0	180.33	0.00
27.20	0.00	0	180.33	0.00
28.00	0.00	0	180.33	0.00
28.80	0.00	0	180.33	0.00
29.60	0.00	0	180.33	0.00

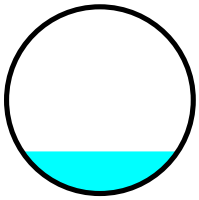
Summary for Reach 2R: 6"PVC

Inflow Area = 3,904 sf, 87.68% Impervious, Inflow Depth = 2.80" for 2-Year event
Inflow = 0.28 cfs @ 11.99 hrs, Volume= 912 cf
Outflow = 0.28 cfs @ 11.99 hrs, Volume= 912 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Max. Velocity= 8.42 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.72 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.11'
Defined Flood Depth= 182.00' Flow Area= 12.3 sf, Capacity= -3,826.91 cfs
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.51 cfs

6.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 33.0' Slope= 0.1188 '/'
Inlet Invert= 183.92', Outlet Invert= 180.00'



Hydrograph for Reach 2R: 6"PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	183.92	0.00
0.80	0.00	0	183.92	0.00
1.60	0.00	0	183.92	0.00
2.40	0.00	0	183.93	0.00
3.20	0.00	0	183.93	0.00
4.00	0.00	0	183.93	0.00
4.80	0.00	0	183.93	0.00
5.60	0.00	0	183.93	0.00
6.40	0.00	0	183.93	0.00
7.20	0.00	0	183.94	0.00
8.00	0.01	0	183.94	0.01
8.80	0.01	0	183.94	0.01
9.60	0.01	0	183.94	0.01
10.40	0.02	0	183.95	0.02
11.20	0.02	0	183.95	0.02
12.00	**0.28**	**1**	**184.03**	**0.28**
12.80	0.02	0	183.95	0.02
13.60	0.02	0	183.95	0.02
14.40	0.01	0	183.94	0.01
15.20	0.01	0	183.94	0.01
16.00	0.01	0	183.94	0.01
16.80	0.01	0	183.94	0.01
17.60	0.00	0	183.94	0.00
18.40	0.00	0	183.94	0.00
19.20	0.00	0	183.93	0.00
20.00	0.00	0	183.93	0.00
20.80	0.00	0	183.93	0.00
21.60	0.00	0	183.93	0.00
22.40	0.00	0	183.93	0.00
23.20	0.00	0	183.93	0.00
24.00	0.00	0	183.93	0.00
24.80	0.00	0	183.92	0.00
25.60	0.00	0	183.92	0.00
26.40	0.00	0	183.92	0.00
27.20	0.00	0	183.92	0.00
28.00	0.00	0	183.92	0.00
28.80	0.00	0	183.92	0.00
29.60	0.00	0	183.92	0.00

Summary for Pond 1-P: LEACH FIELD - 1

Inflow Area = 4,894 sf,100.00% Impervious, Inflow Depth = 3.20" for 2-Year event
Inflow = 0.38 cfs @ 12.01 hrs, Volume= 1,304 cf
Outflow = 0.04 cfs @ 12.62 hrs, Volume= 1,304 cf, Atten= 89%, Lag= 36.6 min
Discarded = 0.04 cfs @ 12.62 hrs, Volume= 1,304 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 183.88' @ 12.62 hrs Surf.Area= 574 sf Storage= 469 cf
Flood Elev= 190.00' Surf.Area= 930 sf Storage= 1,553 cf

Plug-Flow detention time= 89.3 min calculated for 1,300 cf (100% of inflow)
Center-of-Mass det. time= 89.1 min (839.3 - 750.2)

Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	432 cf	**Cultec R-V8** x 8 Inside #2 Effective Size= 52.6"W x 34.0"H => 8.93 sf x 7.50'L = 67.0 cf Overall Size= 54.0"W x 34.0"H x 8.00'L with 0.50' Overlap Row Length Adjustment= -5.83' x 8.93 sf x 2 rows
#2	182.00'	1,121 cf	**13.25'W x 30.00'L x 5.00'H Prismatoid Z=1.0** 3,235 cf Overall - 432 cf Embedded = 2,804 cf x 40.0% Voids
		1,553 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	182.00'	**2.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 171.00'
#2	Primary	189.00'	**2.0" x 2.0" Horiz. Orifice/Grate X 100.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 12.62 hrs HW=183.88' (Free Discharge)
1=Exfiltration (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=182.00' (Free Discharge)
2=Orifice/Grate (Controls 0.00 cfs)

Hydrograph for Pond 1-P: LEACH FIELD - 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	182.00	0.00	0.00	**0.00**
0.80	0.00	0	182.00	0.00	0.00	0.00
1.60	0.00	0	182.00	0.00	0.00	0.00
2.40	0.00	1	182.00	0.00	0.00	0.00
3.20	0.00	1	182.01	0.00	0.00	0.00
4.00	0.00	1	182.01	0.00	0.00	0.00
4.80	0.00	2	182.01	0.00	0.00	0.00
5.60	0.00	2	182.01	0.00	0.00	0.00
6.40	0.01	3	182.02	0.01	0.01	0.00
7.20	0.01	4	182.02	0.01	0.01	0.00
8.00	0.01	5	182.03	0.01	0.01	0.00
8.80	0.01	6	182.04	0.01	0.01	0.00
9.60	0.02	8	182.05	0.02	0.02	0.00
10.40	0.02	11	182.07	0.02	0.02	0.00
11.20	0.03	19	182.12	0.02	0.02	0.00
12.00	**0.38**	**246**	**183.21**	**0.04**	**0.04**	0.00
12.80	0.04	**466**	**183.88**	**0.04**	**0.04**	0.00
13.60	0.02	425	183.75	0.04	0.04	0.00
14.40	0.02	365	183.58	0.04	0.04	0.00
15.20	0.01	301	183.38	0.04	0.04	0.00
16.00	0.01	232	183.17	0.03	0.03	0.00
16.80	0.01	162	182.93	0.03	0.03	0.00
17.60	0.01	98	182.58	0.03	0.03	0.00
18.40	0.01	39	182.24	0.03	0.03	0.00
19.20	0.01	4	182.02	0.01	0.01	0.00
20.00	0.01	3	182.02	0.01	0.01	0.00
20.80	0.00	3	182.02	0.00	0.00	0.00
21.60	0.00	2	182.01	0.00	0.00	0.00
22.40	0.00	2	182.01	0.00	0.00	0.00
23.20	0.00	2	182.01	0.00	0.00	0.00
24.00	0.00	2	182.01	0.00	0.00	0.00
24.80	0.00	0	182.00	0.00	0.00	0.00
25.60	0.00	0	182.00	0.00	0.00	0.00
26.40	0.00	0	182.00	0.00	0.00	0.00
27.20	0.00	0	182.00	0.00	0.00	0.00
28.00	0.00	0	182.00	0.00	0.00	0.00
28.80	0.00	0	182.00	0.00	0.00	0.00
29.60	0.00	0	182.00	0.00	0.00	0.00

Summary for Pond 2A-P: CATCH BASIN #1

Inflow Area = 3,904 sf, 87.68% Impervious, Inflow Depth = 2.80" for 2-Year event
Inflow = 0.28 cfs @ 11.99 hrs, Volume= 912 cf
Outflow = 0.28 cfs @ 11.99 hrs, Volume= 912 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.28 cfs @ 11.99 hrs, Volume= 912 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 185.34' @ 11.99 hrs
Flood Elev= 190.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.27 cfs @ 11.99 hrs HW=185.33' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.27 cfs @ 1.96 fps)

Hydrograph for Pond 2A-P: CATCH BASIN #1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	185.00	0.00	21.20	0.00	185.02	0.00
0.40	0.00	185.00	0.00	21.60	0.00	185.02	0.00
0.80	0.00	185.00	0.00	22.00	0.00	185.02	0.00
1.20	0.00	185.00	0.00	22.40	0.00	185.02	0.00
1.60	0.00	185.00	0.00	22.80	0.00	185.02	0.00
2.00	0.00	185.00	0.00	23.20	0.00	185.02	0.00
2.40	0.00	185.01	0.00	23.60	0.00	185.02	0.00
2.80	0.00	185.01	0.00	24.00	0.00	185.01	0.00
3.20	0.00	185.01	0.00	24.40	0.00	185.00	0.00
3.60	0.00	185.01	0.00	24.80	0.00	185.00	0.00
4.00	0.00	185.01	0.00	25.20	0.00	185.00	0.00
4.40	0.00	185.01	0.00	25.60	0.00	185.00	0.00
4.80	0.00	185.02	0.00	26.00	0.00	185.00	0.00
5.20	0.00	185.02	0.00	26.40	0.00	185.00	0.00
5.60	0.00	185.02	0.00	26.80	0.00	185.00	0.00
6.00	0.00	185.02	0.00	27.20	0.00	185.00	0.00
6.40	0.00	185.02	0.00	27.60	0.00	185.00	0.00
6.80	0.00	185.03	0.00	28.00	0.00	185.00	0.00
7.20	0.00	185.03	0.00	28.40	0.00	185.00	0.00
7.60	0.01	185.04	0.01	28.80	0.00	185.00	0.00
8.00	0.01	185.04	0.01	29.20	0.00	185.00	0.00
8.40	0.01	185.05	0.01	29.60	0.00	185.00	0.00
8.80	0.01	185.05	0.01	30.00	0.00	185.00	0.00
9.20	0.01	185.05	0.01				
9.60	0.01	185.06	0.01				
10.00	0.01	185.06	0.01				
10.40	0.02	185.07	0.02				
10.80	0.02	185.07	0.02				
11.20	0.02	185.09	0.02				
11.60	0.06	185.14	0.06				
12.00	**0.28**	**185.34**	**0.28**				
12.40	0.05	185.13	0.05				
12.80	0.02	185.09	0.02				
13.20	0.02	185.07	0.02				
13.60	0.02	185.07	0.02				
14.00	0.01	185.06	0.01				
14.40	0.01	185.06	0.01				
14.80	0.01	185.06	0.01				
15.20	0.01	185.05	0.01				
15.60	0.01	185.05	0.01				
16.00	0.01	185.05	0.01				
16.40	0.01	185.04	0.01				
16.80	0.01	185.04	0.01				
17.20	0.01	185.03	0.01				
17.60	0.00	185.03	0.00				
18.00	0.00	185.03	0.00				
18.40	0.00	185.03	0.00				
18.80	0.00	185.03	0.00				
19.20	0.00	185.02	0.00				
19.60	0.00	185.02	0.00				
20.00	0.00	185.02	0.00				
20.40	0.00	185.02	0.00				
20.80	0.00	185.02	0.00				

Summary for Pond 2P: LEACH FIELD-2

Inflow Area = 8,042 sf, 81.72% Impervious, Inflow Depth = 2.61" for 2-Year event
Inflow = 0.51 cfs @ 12.00 hrs, Volume= 1,751 cf
Outflow = 0.06 cfs @ 12.60 hrs, Volume= 1,751 cf, Atten= 89%, Lag= 35.7 min
Discarded = 0.06 cfs @ 12.60 hrs, Volume= 1,751 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 179.41' @ 12.60 hrs Surf.Area= 552 sf Storage= 674 cf
Flood Elev= 183.00' Surf.Area= 720 sf Storage= 1,145 cf

Plug-Flow detention time= 106.0 min calculated for 1,747 cf (100% of inflow)
Center-of-Mass det. time= 105.7 min (855.8 - 750.1)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	528 cf	**Cultec R-280HD** x 12 Inside #2 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
#2	177.00'	616 cf	**12.00'W x 28.00'L x 4.00'H Prismatoid Z=1.0** 2,069 cf Overall - 528 cf Embedded = 1,541 cf x 40.0% Voids
		1,145 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.00'	**2.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 174.00'
#2	Primary	182.00'	**2.0" x 2.0" Horiz. Orifice/Grate X 100.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 12.60 hrs HW=179.41' (Free Discharge)
1=Exfiltration (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=177.00' (Free Discharge)
2=Orifice/Grate (Controls 0.00 cfs)

Hydrograph for Pond 2P: LEACH FIELD-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	177.00	0.00	0.00	**0.00**
0.80	0.00	0	177.00	0.00	0.00	0.00
1.60	0.00	0	177.00	0.00	0.00	0.00
2.40	0.00	1	177.00	0.00	0.00	0.00
3.20	0.00	1	177.01	0.00	0.00	0.00
4.00	0.00	1	177.01	0.00	0.00	0.00
4.80	0.00	2	177.01	0.00	0.00	0.00
5.60	0.01	2	177.02	0.01	0.01	0.00
6.40	0.01	3	177.02	0.01	0.01	0.00
7.20	0.01	4	177.03	0.01	0.01	0.00
8.00	0.01	5	177.03	0.01	0.01	0.00
8.80	0.02	6	177.05	0.02	0.02	0.00
9.60	0.02	8	177.06	0.02	0.02	0.00
10.40	0.03	20	177.14	0.02	0.02	0.00
11.20	0.05	54	177.39	0.02	0.02	0.00
12.00	**0.51**	**386**	**178.63**	**0.04**	**0.04**	0.00
12.80	0.05	**670**	**179.40**	**0.06**	**0.06**	0.00
13.60	0.03	612	179.24	0.05	0.05	0.00
14.40	0.02	534	179.03	0.05	0.05	0.00
15.20	0.02	453	178.81	0.05	0.05	0.00
16.00	0.01	368	178.58	0.04	0.04	0.00
16.80	0.01	285	178.36	0.04	0.04	0.00
17.60	0.01	206	178.15	0.04	0.04	0.00
18.40	0.01	132	177.88	0.03	0.03	0.00
19.20	0.01	70	177.49	0.03	0.03	0.00
20.00	0.01	22	177.16	0.02	0.02	0.00
20.80	0.01	3	177.02	0.01	0.01	0.00
21.60	0.01	2	177.02	0.01	0.01	0.00
22.40	0.01	2	177.02	0.01	0.01	0.00
23.20	0.00	2	177.01	0.00	0.00	0.00
24.00	0.00	2	177.01	0.00	0.00	0.00
24.80	0.00	0	177.00	0.00	0.00	0.00
25.60	0.00	0	177.00	0.00	0.00	0.00
26.40	0.00	0	177.00	0.00	0.00	0.00
27.20	0.00	0	177.00	0.00	0.00	0.00
28.00	0.00	0	177.00	0.00	0.00	0.00
28.80	0.00	0	177.00	0.00	0.00	0.00
29.60	0.00	0	177.00	0.00	0.00	0.00

Summary for Pond 3P: DRYWELLS

Inflow Area = 4,913 sf, 29.17% Impervious, Inflow Depth = 0.36" for 2-Year event
Inflow = 0.02 cfs @ 12.10 hrs, Volume= 146 cf
Outflow = 0.01 cfs @ 12.49 hrs, Volume= 146 cf, Atten= 55%, Lag= 23.5 min
Discarded = 0.01 cfs @ 12.49 hrs, Volume= 146 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 176.27' @ 12.49 hrs Surf.Area= 157 sf Storage= 17 cf
Flood Elev= 189.00' Surf.Area= 157 sf Storage= 447 cf

Plug-Flow detention time= 16.6 min calculated for 145 cf (100% of inflow)
Center-of-Mass det. time= 16.6 min (945.9 - 929.3)

Volume	Invert	Avail.Storage	Storage Description
#1	176.00'	278 cf	**10.00'D x 5.50'H Vertical Cone/Cylinder** x 2 864 cf Overall - 170 cf Embedded = 694 cf x 40.0% Voids
#2	177.00'	170 cf	**6.00'D x 3.00'H Vertical Cone/Cylinder** x 2 Inside #1
		447 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	176.00'	**2.500 in/hr Exfiltration over Wetted area**
#2	Primary	182.00'	**24.0" x 24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.49 hrs HW=176.27' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=176.00' (Free Discharge)
2=Orifice/Grate (Controls 0.00 cfs)

Hydrograph for Pond 3P: DRYWELLS

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	176.00	0.00	0.00	**0.00**
0.80	0.00	0	176.00	0.00	0.00	0.00
1.60	0.00	0	176.00	0.00	0.00	0.00
2.40	0.00	0	176.00	0.00	0.00	0.00
3.20	0.00	0	176.00	0.00	0.00	0.00
4.00	0.00	0	176.00	0.00	0.00	0.00
4.80	0.00	0	176.00	0.00	0.00	0.00
5.60	0.00	0	176.00	0.00	0.00	0.00
6.40	0.00	0	176.00	0.00	0.00	0.00
7.20	0.00	0	176.00	0.00	0.00	0.00
8.00	0.00	0	176.00	0.00	0.00	0.00
8.80	0.00	0	176.00	0.00	0.00	0.00
9.60	0.00	0	176.00	0.00	0.00	0.00
10.40	0.00	0	176.00	0.00	0.00	0.00
11.20	0.00	0	176.00	0.00	0.00	0.00
12.00	**0.01**	**2**	**176.03**	**0.00**	**0.00**	0.00
12.80	**0.01**	**15**	**176.23**	**0.01**	**0.01**	0.00
13.60	0.01	6	176.09	0.01	0.01	0.00
14.40	0.00	4	176.06	0.00	0.00	0.00
15.20	0.00	3	176.05	0.00	0.00	0.00
16.00	0.00	3	176.04	0.00	0.00	0.00
16.80	0.00	2	176.04	0.00	0.00	0.00
17.60	0.00	2	176.03	0.00	0.00	0.00
18.40	0.00	2	176.03	0.00	0.00	0.00
19.20	0.00	2	176.02	0.00	0.00	0.00
20.00	0.00	1	176.02	0.00	0.00	0.00
20.80	0.00	1	176.02	0.00	0.00	0.00
21.60	0.00	1	176.02	0.00	0.00	0.00
22.40	0.00	1	176.02	0.00	0.00	0.00
23.20	0.00	1	176.02	0.00	0.00	0.00
24.00	0.00	1	176.01	0.00	0.00	0.00
24.80	0.00	0	176.00	0.00	0.00	0.00
25.60	0.00	0	176.00	0.00	0.00	0.00
26.40	0.00	0	176.00	0.00	0.00	0.00
27.20	0.00	0	176.00	0.00	0.00	0.00
28.00	0.00	0	176.00	0.00	0.00	0.00
28.80	0.00	0	176.00	0.00	0.00	0.00
29.60	0.00	0	176.00	0.00	0.00	0.00

Summary for Pond 4P: DISCARDED

Inflow Area = 3,103 sf, 66.58% Impervious, Inflow Depth = 2.13" for 2-Year event
Inflow = 0.16 cfs @ 12.01 hrs, Volume= 550 cf
Primary = 0.16 cfs @ 12.01 hrs, Volume= 550 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs

Hydrograph for Pond 4P: DISCARDED

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00		0.00	21.20	0.00		0.00
0.40	0.00		0.00	21.60	0.00		0.00
0.80	0.00		0.00	22.00	0.00		0.00
1.20	0.00		0.00	22.40	0.00		0.00
1.60	0.00		0.00	22.80	0.00		0.00
2.00	0.00		0.00	23.20	0.00		0.00
2.40	0.00		0.00	23.60	0.00		0.00
2.80	0.00		0.00	24.00	0.00		0.00
3.20	0.00		0.00	24.40	0.00		0.00
3.60	0.00		0.00	24.80	0.00		0.00
4.00	0.00		0.00	25.20	0.00		0.00
4.40	0.00		0.00	25.60	0.00		0.00
4.80	0.00		0.00	26.00	0.00		0.00
5.20	0.00		0.00	26.40	0.00		0.00
5.60	0.00		0.00	26.80	0.00		0.00
6.00	0.00		0.00	27.20	0.00		0.00
6.40	0.00		0.00	27.60	0.00		0.00
6.80	0.00		0.00	28.00	0.00		0.00
7.20	0.00		0.00	28.40	0.00		0.00
7.60	0.00		0.00	28.80	0.00		0.00
8.00	0.00		0.00	29.20	0.00		0.00
8.40	0.00		0.00	29.60	0.00		0.00
8.80	0.01		0.01	30.00	0.00		0.00
9.20	0.01		0.01				
9.60	0.01		0.01				
10.00	0.01		0.01				
10.40	0.01		0.01				
10.80	0.01		0.01				
11.20	0.01		0.01				
11.60	0.03		0.03				
12.00	**0.16**		**0.16**				
12.40	0.04		0.04				
12.80	0.02		0.02				
13.20	0.01		0.01				
13.60	0.01		0.01				
14.00	0.01		0.01				
14.40	0.01		0.01				
14.80	0.01		0.01				
15.20	0.01		0.01				
15.60	0.01		0.01				
16.00	0.00		0.00				
16.40	0.00		0.00				
16.80	0.00		0.00				
17.20	0.00		0.00				
17.60	0.00		0.00				
18.00	0.00		0.00				
18.40	0.00		0.00				
18.80	0.00		0.00				
19.20	0.00		0.00				
19.60	0.00		0.00				
20.00	0.00		0.00				
20.40	0.00		0.00				
20.80	0.00		0.00				

Time span=0.00-30.00 hrs, dt=0.08 hrs, 376 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A-S: ROOF DISCARDED Runoff Area=2,066 sf 100.00% Impervious Runoff Depth=5.09"
Flow Length=102' Slope=0.0050 '/' Tc=3.5 min CN=98 Runoff=0.36 cfs 877 cf

Subcatchment 1S: ROOF Runoff Area=4,894 sf 100.00% Impervious Runoff Depth=5.09"
Flow Length=102' Slope=0.0050 '/' Tc=3.5 min CN=98 Runoff=0.86 cfs 2,077 cf

Subcatchment 2S: Parking+Drive(WS1) Runoff Area=3,423 sf 100.00% Impervious Runoff Depth=5.09"
Flow Length=103' Tc=1.8 min CN=98 Runoff=0.59 cfs 1,453 cf

Subcatchment 3S: LAWN-WS3 Runoff Area=481 sf 0.00% Impervious Runoff Depth=0.27"
Flow Length=28' Slope=0.0200 '/' Tc=3.4 min CN=39 Runoff=0.00 cfs 11 cf

Subcatchment 4S: PARKING+DRIVE(WS2) Runoff Area=3,149 sf 100.00% Impervious Runoff Depth=5.09"
Flow Length=95' Tc=3.9 min CN=98 Runoff=0.55 cfs 1,336 cf

Subcatchment 5S: LAWN-WS4 Runoff Area=989 sf 0.00% Impervious Runoff Depth=0.27"
Flow Length=28' Slope=0.0200 '/' Tc=3.4 min CN=39 Runoff=0.00 cfs 22 cf

Subcatchment 6S: LAWN+PATHS-WS6 Runoff Area=4,913 sf 29.17% Impervious Runoff Depth=1.22"
Flow Length=20' Slope=0.0200 '/' Tc=2.6 min CN=56 Runoff=0.24 cfs 498 cf

Subcatchment 7S: UNDISTURBEDGREEN - WS5 Runoff Area=1,037 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=9' Slope=0.0350 '/' Tc=1.1 min CN=32 Runoff=0.00 cfs 5 cf

Reach 1R: 8"X8"TRENCHDRAIN Avg. Flow Depth=0.24' Max Vel=4.56 fps Inflow=0.55 cfs 1,359 cf
x 0.75 n=0.010 L=18.0' S=0.0278 '/' Capacity=2.00 cfs Outflow=0.55 cfs 1,359 cf

Reach 2R: 6"PVC Avg. Flow Depth=0.16' Max Vel=10.40 fps Inflow=0.59 cfs 1,464 cf
6.0" Round Pipe n=0.010 L=33.0' S=0.1188 '/' Capacity=2.51 cfs Outflow=0.59 cfs 1,464 cf

Pond 1-P: LEACH FIELD - 1 Peak Elev=185.09' Storage=898 cf Inflow=0.86 cfs 2,077 cf
Discarded=0.06 cfs 2,077 cf Primary=0.00 cfs 0 cf Outflow=0.06 cfs 2,077 cf

Pond 2A-P: CATCH BASIN #1 Peak Elev=185.63' Inflow=0.59 cfs 1,464 cf
Outflow=0.59 cfs 1,464 cf

Pond 2P: LEACH FIELD-2 Peak Elev=182.14' Storage=1,145 cf Inflow=1.12 cfs 2,822 cf
Discarded=0.11 cfs 2,731 cf Primary=0.32 cfs 91 cf Outflow=0.42 cfs 2,822 cf

Pond 3P: DRYWELLS Peak Elev=178.21' Storage=180 cf Inflow=0.24 cfs 498 cf
Discarded=0.02 cfs 498 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 498 cf

Pond 4P: DISCARDED Inflow=0.36 cfs 881 cf
Primary=0.36 cfs 881 cf

Total Runoff Area = 20,952 sf Runoff Volume = 6,279 cf Average Runoff Depth = 3.60"
28.57% Pervious = 5,987 sf 71.43% Impervious = 14,965 sf

Summary for Subcatchment 1A-S: ROOF DISCARDED

Runoff = 0.36 cfs @ 11.89 hrs, Volume= 877 cf, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type II 24-hr 10-Year Rainfall=5.33"

Area (sf)	CN	Description
2,066	98	Paved parking & roofs
2,066		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	32	0.0050	0.65		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
0.3	35	0.0050	2.11	0.29	**Pipe Channel, gutter** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.011 Steel, smooth
2.4	35	0.0050	0.24	0.05	**Pipe Channel, Drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.110
3.5	102	Total			

Hydrograph for Subcatchment 1A-S: ROOF DISCARDED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.02	0.00	0.00
0.80	0.04	0.00	0.00
1.20	0.07	0.00	0.00
1.60	0.09	0.01	0.00
2.00	0.12	0.02	0.00
2.40	0.14	0.03	0.00
2.80	0.17	0.05	0.00
3.20	0.20	0.07	0.00
3.60	0.23	0.09	0.00
4.00	0.26	0.11	0.00
4.40	0.29	0.13	0.00
4.80	0.32	0.16	0.00
5.20	0.35	0.19	0.00
5.60	0.39	0.22	0.00
6.00	0.43	0.25	0.00
6.40	0.47	0.29	0.00
6.80	0.51	0.32	0.00
7.20	0.55	0.36	0.00
7.60	0.59	0.40	0.01
8.00	0.64	0.45	0.01
8.40	0.69	0.49	0.01
8.80	0.75	0.55	0.01
9.20	0.82	0.62	0.01
9.60	0.89	0.68	0.01
10.00	0.96	0.76	0.01
10.40	1.06	0.85	0.01
10.80	1.18	0.97	0.02
11.20	1.34	1.12	0.02
11.60	1.64	1.41	**0.08**
12.00	3.53	3.30	**0.13**
12.40	3.87	3.63	0.03
12.80	4.04	3.81	0.02
13.20	4.18	3.94	0.01
13.60	4.28	4.05	0.01
14.00	4.37	4.13	0.01
14.40	4.45	4.21	0.01
14.80	4.52	4.28	0.01
15.20	4.58	4.34	0.01
15.60	4.64	4.40	0.01
16.00	4.69	4.45	0.01
16.40	4.74	4.50	0.01
16.80	4.78	4.55	0.01
17.20	4.83	4.59	0.01
17.60	4.87	4.63	0.00
18.00	4.91	4.67	0.00
18.40	4.95	4.71	0.00
18.80	4.98	4.74	0.00
19.20	5.01	4.78	0.00
19.60	5.05	4.81	0.00
20.00	5.07	4.84	0.00
20.40	5.10	4.86	0.00
20.80	5.13	4.89	0.00
21.20	5.16	4.92	0.00
21.60	5.18	4.94	0.00
22.00	5.21	4.97	0.00
22.40	5.23	5.00	0.00
22.80	5.26	5.02	0.00
23.20	5.28	5.04	0.00
23.60	5.31	5.07	0.00
24.00	**5.33**	**5.09**	0.00
24.40	5.33	5.09	0.00
24.80	5.33	5.09	0.00
25.20	5.33	5.09	0.00
25.60	5.33	5.09	0.00
26.00	5.33	5.09	0.00
26.40	5.33	5.09	0.00
26.80	5.33	5.09	0.00
27.20	5.33	5.09	0.00
27.60	5.33	5.09	0.00
28.00	5.33	5.09	0.00
28.40	5.33	5.09	0.00
28.80	5.33	5.09	0.00
29.20	5.33	5.09	0.00
29.60	5.33	5.09	0.00
30.00	5.33	5.09	0.00

Summary for Subcatchment 1S: ROOF

Runoff = 0.86 cfs @ 11.89 hrs, Volume= 2,077 cf, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type II 24-hr 10-Year Rainfall=5.33"

Area (sf)	CN	Description
4,894	98	Paved parking & roofs
4,894		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	32	0.0050	0.65		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
0.3	35	0.0050	2.11	0.29	**Pipe Channel, gutter** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.011 Steel, smooth
2.4	35	0.0050	0.24	0.05	**Pipe Channel, Drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.110
3.5	102	Total			

Hydrograph for Subcatchment 1S: ROOF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.02	0.00	0.00
0.80	0.04	0.00	0.00
1.20	0.07	0.00	0.00
1.60	0.09	0.01	0.00
2.00	0.12	0.02	0.00
2.40	0.14	0.03	0.00
2.80	0.17	0.05	0.00
3.20	0.20	0.07	0.01
3.60	0.23	0.09	0.01
4.00	0.26	0.11	0.01
4.40	0.29	0.13	0.01
4.80	0.32	0.16	0.01
5.20	0.35	0.19	0.01
5.60	0.39	0.22	0.01
6.00	0.43	0.25	0.01
6.40	0.47	0.29	0.01
6.80	0.51	0.32	0.01
7.20	0.55	0.36	0.01
7.60	0.59	0.40	0.01
8.00	0.64	0.45	0.01
8.40	0.69	0.49	0.01
8.80	0.75	0.55	0.02
9.20	0.82	0.62	0.02
9.60	0.89	0.68	0.02
10.00	0.96	0.76	0.02
10.40	1.06	0.85	0.03
10.80	1.18	0.97	0.04
11.20	1.34	1.12	0.05
11.60	1.64	1.41	**0.19**
12.00	3.53	3.30	**0.31**
12.40	3.87	3.63	0.07
12.80	4.04	3.81	0.04
13.20	4.18	3.94	0.03
13.60	4.28	4.05	0.03
14.00	4.37	4.13	0.02
14.40	4.45	4.21	0.02
14.80	4.52	4.28	0.02
15.20	4.58	4.34	0.02
15.60	4.64	4.40	0.02
16.00	4.69	4.45	0.01
16.40	4.74	4.50	0.01
16.80	4.78	4.55	0.01
17.20	4.83	4.59	0.01
17.60	4.87	4.63	0.01
18.00	4.91	4.67	0.01
18.40	4.95	4.71	0.01
18.80	4.98	4.74	0.01
19.20	5.01	4.78	0.01
19.60	5.05	4.81	0.01
20.00	5.07	4.84	0.01
20.40	5.10	4.86	0.01
20.80	5.13	4.89	0.01
21.20	5.16	4.92	0.01
21.60	5.18	4.94	0.01
22.00	5.21	4.97	0.01
22.40	5.23	5.00	0.01
22.80	5.26	5.02	0.01
23.20	5.28	5.04	0.01
23.60	5.31	5.07	0.01
24.00	**5.33**	**5.09**	0.00
24.40	5.33	5.09	0.00
24.80	5.33	5.09	0.00
25.20	5.33	5.09	0.00
25.60	5.33	5.09	0.00
26.00	5.33	5.09	0.00
26.40	5.33	5.09	0.00
26.80	5.33	5.09	0.00
27.20	5.33	5.09	0.00
27.60	5.33	5.09	0.00
28.00	5.33	5.09	0.00
28.40	5.33	5.09	0.00
28.80	5.33	5.09	0.00
29.20	5.33	5.09	0.00
29.60	5.33	5.09	0.00
30.00	5.33	5.09	0.00

Summary for Subcatchment 2S: Parking+Drive (WS1)

Runoff = 0.59 cfs @ 11.86 hrs, Volume= 1,453 cf, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type II 24-hr 10-Year Rainfall=5.33"

Area (sf)	CN	Description
3,423	98	Paved parking & roofs
3,423		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	70	0.0350	1.65		**Sheet Flow, Paved Area** Smooth surfaces n= 0.011 P2= 3.40"
1.1	33	0.1700	0.50	0.01	**Pipe Channel, Drain** 6.0" Round w/ 5.0" inside fill Area= 0.0 sf Perim= 0.8' r= 0.03' n= 0.110
1.8	103	Total			

Hydrograph for Subcatchment 2S: Parking+Drive (WS1)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.02	0.00	0.00
0.80	0.04	0.00	0.00
1.20	0.07	0.00	0.00
1.60	0.09	0.01	0.00
2.00	0.12	0.02	0.00
2.40	0.14	0.03	0.00
2.80	0.17	0.05	0.00
3.20	0.20	0.07	0.00
3.60	0.23	0.09	0.00
4.00	0.26	0.11	0.00
4.40	0.29	0.13	0.00
4.80	0.32	0.16	0.01
5.20	0.35	0.19	0.01
5.60	0.39	0.22	0.01
6.00	0.43	0.25	0.01
6.40	0.47	0.29	0.01
6.80	0.51	0.32	0.01
7.20	0.55	0.36	0.01
7.60	0.59	0.40	0.01
8.00	0.64	0.45	0.01
8.40	0.69	0.49	0.01
8.80	0.75	0.55	0.01
9.20	0.82	0.62	0.01
9.60	0.89	0.68	0.01
10.00	0.96	0.76	0.02
10.40	1.06	0.85	0.02
10.80	1.18	0.97	0.03
11.20	1.34	1.12	0.04
11.60	1.64	1.41	**0.16**
12.00	3.53	3.30	**0.12**
12.40	3.87	3.63	0.05
12.80	4.04	3.81	0.03
13.20	4.18	3.94	0.02
13.60	4.28	4.05	0.02
14.00	4.37	4.13	0.02
14.40	4.45	4.21	0.01
14.80	4.52	4.28	0.01
15.20	4.58	4.34	0.01
15.60	4.64	4.40	0.01
16.00	4.69	4.45	0.01
16.40	4.74	4.50	0.01
16.80	4.78	4.55	0.01
17.20	4.83	4.59	0.01
17.60	4.87	4.63	0.01
18.00	4.91	4.67	0.01
18.40	4.95	4.71	0.01
18.80	4.98	4.74	0.01
19.20	5.01	4.78	0.01
19.60	5.05	4.81	0.01
20.00	5.07	4.84	0.01
20.40	5.10	4.86	0.01
20.80	5.13	4.89	0.01
21.20	5.16	4.92	0.01
21.60	5.18	4.94	0.01
22.00	5.21	4.97	0.01
22.40	5.23	5.00	0.00
22.80	5.26	5.02	0.00
23.20	5.28	5.04	0.00
23.60	5.31	5.07	0.00
24.00	**5.33**	**5.09**	0.00
24.40	5.33	5.09	0.00
24.80	5.33	5.09	0.00
25.20	5.33	5.09	0.00
25.60	5.33	5.09	0.00
26.00	5.33	5.09	0.00
26.40	5.33	5.09	0.00
26.80	5.33	5.09	0.00
27.20	5.33	5.09	0.00
27.60	5.33	5.09	0.00
28.00	5.33	5.09	0.00
28.40	5.33	5.09	0.00
28.80	5.33	5.09	0.00
29.20	5.33	5.09	0.00
29.60	5.33	5.09	0.00
30.00	5.33	5.09	0.00

Summary for Subcatchment 3S: LAWN-WS3

Runoff = 0.00 cfs @ 12.00 hrs, Volume= 11 cf, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type II 24-hr 10-Year Rainfall=5.33"

Area (sf)	CN	Description
481	39	>75% Grass cover, Good, HSG A
481		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	28	0.0200	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 3S: LAWN-WS3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.02	0.00	0.00
0.80	0.04	0.00	0.00
1.20	0.07	0.00	0.00
1.60	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.40	0.14	0.00	0.00
2.80	0.17	0.00	0.00
3.20	0.20	0.00	0.00
3.60	0.23	0.00	0.00
4.00	0.26	0.00	0.00
4.40	0.29	0.00	0.00
4.80	0.32	0.00	0.00
5.20	0.35	0.00	0.00
5.60	0.39	0.00	0.00
6.00	0.43	0.00	0.00
6.40	0.47	0.00	0.00
6.80	0.51	0.00	0.00
7.20	0.55	0.00	0.00
7.60	0.59	0.00	0.00
8.00	0.64	0.00	0.00
8.40	0.69	0.00	0.00
8.80	0.75	0.00	0.00
9.20	0.82	0.00	0.00
9.60	0.89	0.00	0.00
10.00	0.96	0.00	0.00
10.40	1.06	0.00	0.00
10.80	1.18	0.00	0.00
11.20	1.34	0.00	0.00
11.60	1.64	0.00	0.00
12.00	3.53	0.01	**0.00**
12.40	3.87	0.03	0.00
12.80	4.04	0.05	0.00
13.20	4.18	0.07	0.00
13.60	4.28	0.08	0.00
14.00	4.37	0.09	0.00
14.40	4.45	0.10	0.00
14.80	4.52	0.11	0.00
15.20	4.58	0.12	0.00
15.60	4.64	0.13	0.00
16.00	4.69	0.14	0.00
16.40	4.74	0.15	0.00
16.80	4.78	0.16	0.00
17.20	4.83	0.17	0.00
17.60	4.87	0.17	0.00
18.00	4.91	0.18	0.00
18.40	4.95	0.19	0.00
18.80	4.98	0.20	0.00
19.20	5.01	0.20	0.00
19.60	5.05	0.21	0.00
20.00	5.07	0.22	0.00
20.40	5.10	0.22	0.00
20.80	5.13	0.23	0.00
21.20	5.16	0.23	0.00
21.60	5.18	0.24	0.00
22.00	5.21	0.24	0.00
22.40	5.23	0.25	0.00
22.80	5.26	0.26	0.00
23.20	5.28	0.26	0.00
23.60	5.31	0.27	0.00
24.00	**5.33**	**0.27**	0.00
24.40	5.33	0.27	0.00
24.80	5.33	0.27	0.00
25.20	5.33	0.27	0.00
25.60	5.33	0.27	0.00
26.00	5.33	0.27	0.00
26.40	5.33	0.27	0.00
26.80	5.33	0.27	0.00
27.20	5.33	0.27	0.00
27.60	5.33	0.27	0.00
28.00	5.33	0.27	0.00
28.40	5.33	0.27	0.00
28.80	5.33	0.27	0.00
29.20	5.33	0.27	0.00
29.60	5.33	0.27	0.00
30.00	5.33	0.27	0.00

Summary for Subcatchment 4S: PARKING+ DRIVE(WS2)

Runoff = 0.55 cfs @ 11.90 hrs, Volume= 1,336 cf, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type II 24-hr 10-Year Rainfall=5.33"

Area (sf)	CN	Description
3,149	98	Paved parking & roofs
3,149		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	70	0.0700	2.18		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
3.4	25	0.0100	0.12	0.00	**Pipe Channel, Drain** 6.0" Round w/ 5.0" inside fill Area= 0.0 sf Perim= 0.8' r= 0.03' n= 0.110
3.9	95	Total			

Hydrograph for Subcatchment 4S: PARKING+ DRIVE(WS2)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.02	0.00	0.00
0.80	0.04	0.00	0.00
1.20	0.07	0.00	0.00
1.60	0.09	0.01	0.00
2.00	0.12	0.02	0.00
2.40	0.14	0.03	0.00
2.80	0.17	0.05	0.00
3.20	0.20	0.07	0.00
3.60	0.23	0.09	0.00
4.00	0.26	0.11	0.00
4.40	0.29	0.13	0.00
4.80	0.32	0.16	0.00
5.20	0.35	0.19	0.01
5.60	0.39	0.22	0.01
6.00	0.43	0.25	0.01
6.40	0.47	0.29	0.01
6.80	0.51	0.32	0.01
7.20	0.55	0.36	0.01
7.60	0.59	0.40	0.01
8.00	0.64	0.45	0.01
8.40	0.69	0.49	0.01
8.80	0.75	0.55	0.01
9.20	0.82	0.62	0.01
9.60	0.89	0.68	0.01
10.00	0.96	0.76	0.01
10.40	1.06	0.85	0.02
10.80	1.18	0.97	0.02
11.20	1.34	1.12	0.03
11.60	1.64	1.41	**0.12**
12.00	3.53	3.30	**0.22**
12.40	3.87	3.63	0.04
12.80	4.04	3.81	0.03
13.20	4.18	3.94	0.02
13.60	4.28	4.05	0.02
14.00	4.37	4.13	0.01
14.40	4.45	4.21	0.01
14.80	4.52	4.28	0.01
15.20	4.58	4.34	0.01
15.60	4.64	4.40	0.01
16.00	4.69	4.45	0.01
16.40	4.74	4.50	0.01
16.80	4.78	4.55	0.01
17.20	4.83	4.59	0.01
17.60	4.87	4.63	0.01
18.00	4.91	4.67	0.01
18.40	4.95	4.71	0.01
18.80	4.98	4.74	0.01
19.20	5.01	4.78	0.01
19.60	5.05	4.81	0.01
20.00	5.07	4.84	0.01
20.40	5.10	4.86	0.00
20.80	5.13	4.89	0.00
21.20	5.16	4.92	0.00
21.60	5.18	4.94	0.00
22.00	5.21	4.97	0.00
22.40	5.23	5.00	0.00
22.80	5.26	5.02	0.00
23.20	5.28	5.04	0.00
23.60	5.31	5.07	0.00
24.00	**5.33**	**5.09**	0.00
24.40	5.33	5.09	0.00
24.80	5.33	5.09	0.00
25.20	5.33	5.09	0.00
25.60	5.33	5.09	0.00
26.00	5.33	5.09	0.00
26.40	5.33	5.09	0.00
26.80	5.33	5.09	0.00
27.20	5.33	5.09	0.00
27.60	5.33	5.09	0.00
28.00	5.33	5.09	0.00
28.40	5.33	5.09	0.00
28.80	5.33	5.09	0.00
29.20	5.33	5.09	0.00
29.60	5.33	5.09	0.00
30.00	5.33	5.09	0.00

Summary for Subcatchment 5S: LAWN-WS4

Runoff = 0.00 cfs @ 12.00 hrs, Volume= 22 cf, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type II 24-hr 10-Year Rainfall=5.33"

Area (sf)	CN	Description
989	39	>75% Grass cover, Good, HSG A
989		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	28	0.0200	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 5S: LAWN-WS4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.02	0.00	0.00
0.80	0.04	0.00	0.00
1.20	0.07	0.00	0.00
1.60	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.40	0.14	0.00	0.00
2.80	0.17	0.00	0.00
3.20	0.20	0.00	0.00
3.60	0.23	0.00	0.00
4.00	0.26	0.00	0.00
4.40	0.29	0.00	0.00
4.80	0.32	0.00	0.00
5.20	0.35	0.00	0.00
5.60	0.39	0.00	0.00
6.00	0.43	0.00	0.00
6.40	0.47	0.00	0.00
6.80	0.51	0.00	0.00
7.20	0.55	0.00	0.00
7.60	0.59	0.00	0.00
8.00	0.64	0.00	0.00
8.40	0.69	0.00	0.00
8.80	0.75	0.00	0.00
9.20	0.82	0.00	0.00
9.60	0.89	0.00	0.00
10.00	0.96	0.00	0.00
10.40	1.06	0.00	0.00
10.80	1.18	0.00	0.00
11.20	1.34	0.00	0.00
11.60	1.64	0.00	0.00
12.00	3.53	0.01	**0.00**
12.40	3.87	0.03	0.00
12.80	4.04	0.05	0.00
13.20	4.18	0.07	0.00
13.60	4.28	0.08	0.00
14.00	4.37	0.09	0.00
14.40	4.45	0.10	0.00
14.80	4.52	0.11	0.00
15.20	4.58	0.12	0.00
15.60	4.64	0.13	0.00
16.00	4.69	0.14	0.00
16.40	4.74	0.15	0.00
16.80	4.78	0.16	0.00
17.20	4.83	0.17	0.00
17.60	4.87	0.17	0.00
18.00	4.91	0.18	0.00
18.40	4.95	0.19	0.00
18.80	4.98	0.20	0.00
19.20	5.01	0.20	0.00
19.60	5.05	0.21	0.00
20.00	5.07	0.22	0.00
20.40	5.10	0.22	0.00
20.80	5.13	0.23	0.00
21.20	5.16	0.23	0.00
21.60	5.18	0.24	0.00
22.00	5.21	0.24	0.00
22.40	5.23	0.25	0.00
22.80	5.26	0.26	0.00
23.20	5.28	0.26	0.00
23.60	5.31	0.27	0.00
24.00	**5.33**	**0.27**	0.00
24.40	5.33	0.27	0.00
24.80	5.33	0.27	0.00
25.20	5.33	0.27	0.00
25.60	5.33	0.27	0.00
26.00	5.33	0.27	0.00
26.40	5.33	0.27	0.00
26.80	5.33	0.27	0.00
27.20	5.33	0.27	0.00
27.60	5.33	0.27	0.00
28.00	5.33	0.27	0.00
28.40	5.33	0.27	0.00
28.80	5.33	0.27	0.00
29.20	5.33	0.27	0.00
29.60	5.33	0.27	0.00
30.00	5.33	0.27	0.00

Summary for Subcatchment 6S: LAWN+PATHS-WS6

Runoff = 0.24 cfs @ 11.90 hrs, Volume= 498 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type II 24-hr 10-Year Rainfall=5.33"

Area (sf)	CN	Description
3,480	39	>75% Grass cover, Good, HSG A
1,433	98	Paved parking & roofs
4,913	56	Weighted Average
3,480		70.83% Pervious Area
1,433		29.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	20	0.0200	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 6S: LAWN+PATHS-WS6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.02	0.00	0.00
0.80	0.04	0.00	0.00
1.20	0.07	0.00	0.00
1.60	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.40	0.14	0.00	0.00
2.80	0.17	0.00	0.00
3.20	0.20	0.00	0.00
3.60	0.23	0.00	0.00
4.00	0.26	0.00	0.00
4.40	0.29	0.00	0.00
4.80	0.32	0.00	0.00
5.20	0.35	0.00	0.00
5.60	0.39	0.00	0.00
6.00	0.43	0.00	0.00
6.40	0.47	0.00	0.00
6.80	0.51	0.00	0.00
7.20	0.55	0.00	0.00
7.60	0.59	0.00	0.00
8.00	0.64	0.00	0.00
8.40	0.69	0.00	0.00
8.80	0.75	0.00	0.00
9.20	0.82	0.00	0.00
9.60	0.89	0.00	0.00
10.00	0.96	0.00	0.00
10.40	1.06	0.00	0.00
10.80	1.18	0.00	0.00
11.20	1.34	0.00	0.00
11.60	1.64	0.00	**0.00**
12.00	3.53	0.39	**0.08**
12.40	3.87	0.52	0.03
12.80	4.04	0.59	0.02
13.20	4.18	0.65	0.01
13.60	4.28	0.70	0.01
14.00	4.37	0.74	0.01
14.40	4.45	0.77	0.01
14.80	4.52	0.80	0.01
15.20	4.58	0.83	0.01
15.60	4.64	0.86	0.01
16.00	4.69	0.89	0.01
16.40	4.74	0.91	0.01
16.80	4.78	0.93	0.01
17.20	4.83	0.95	0.01
17.60	4.87	0.98	0.01
18.00	4.91	1.00	0.01
18.40	4.95	1.01	0.01
18.80	4.98	1.03	0.00
19.20	5.01	1.05	0.00
19.60	5.05	1.07	0.00
20.00	5.07	1.08	0.00
20.40	5.10	1.09	0.00
20.80	5.13	1.11	0.00
21.20	5.16	1.12	0.00
21.60	5.18	1.14	0.00
22.00	5.21	1.15	0.00
22.40	5.23	1.16	0.00
22.80	5.26	1.18	0.00
23.20	5.28	1.19	0.00
23.60	5.31	1.20	0.00
24.00	**5.33**	**1.22**	0.00
24.40	5.33	1.22	0.00
24.80	5.33	1.22	0.00
25.20	5.33	1.22	0.00
25.60	5.33	1.22	0.00
26.00	5.33	1.22	0.00
26.40	5.33	1.22	0.00
26.80	5.33	1.22	0.00
27.20	5.33	1.22	0.00
27.60	5.33	1.22	0.00
28.00	5.33	1.22	0.00
28.40	5.33	1.22	0.00
28.80	5.33	1.22	0.00
29.20	5.33	1.22	0.00
29.60	5.33	1.22	0.00
30.00	5.33	1.22	0.00

Summary for Subcatchment 7S: UNDISTURBED GREEN - WS5

Runoff = 0.00 cfs @ 17.98 hrs, Volume= 5 cf, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type II 24-hr 10-Year Rainfall=5.33"

Area (sf)	CN	Description
1,037	32	Woods/grass comb., Good, HSG A
1,037		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	9	0.0350	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 7S: UNDISTURBED GREEN - WS5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.02	0.00	0.00
0.80	0.04	0.00	0.00
1.20	0.07	0.00	0.00
1.60	0.09	0.00	0.00
2.00	0.12	0.00	0.00
2.40	0.14	0.00	0.00
2.80	0.17	0.00	0.00
3.20	0.20	0.00	0.00
3.60	0.23	0.00	0.00
4.00	0.26	0.00	0.00
4.40	0.29	0.00	0.00
4.80	0.32	0.00	0.00
5.20	0.35	0.00	0.00
5.60	0.39	0.00	0.00
6.00	0.43	0.00	0.00
6.40	0.47	0.00	0.00
6.80	0.51	0.00	0.00
7.20	0.55	0.00	0.00
7.60	0.59	0.00	0.00
8.00	0.64	0.00	0.00
8.40	0.69	0.00	0.00
8.80	0.75	0.00	0.00
9.20	0.82	0.00	0.00
9.60	0.89	0.00	0.00
10.00	0.96	0.00	0.00
10.40	1.06	0.00	0.00
10.80	1.18	0.00	0.00
11.20	1.34	0.00	0.00
11.60	1.64	0.00	0.00
12.00	3.53	0.00	0.00
12.40	3.87	0.00	0.00
12.80	4.04	0.00	0.00
13.20	4.18	0.00	0.00
13.60	4.28	0.00	0.00
14.00	4.37	0.00	0.00
14.40	4.45	0.00	0.00
14.80	4.52	0.00	0.00
15.20	4.58	0.01	0.00
15.60	4.64	0.01	0.00
16.00	4.69	0.01	0.00
16.40	4.74	0.01	0.00
16.80	4.78	0.01	0.00
17.20	4.83	0.02	0.00
17.60	4.87	0.02	0.00
18.00	4.91	0.02	**0.00**
18.40	4.95	0.02	0.00
18.80	4.98	0.02	0.00
19.20	5.01	0.03	0.00
19.60	5.05	0.03	0.00
20.00	5.07	0.03	0.00
20.40	5.10	0.03	0.00
20.80	5.13	0.03	0.00
21.20	5.16	0.04	0.00
21.60	5.18	0.04	0.00
22.00	5.21	0.04	0.00
22.40	5.23	0.04	0.00
22.80	5.26	0.05	0.00
23.20	5.28	0.05	0.00
23.60	5.31	0.05	0.00
24.00	**5.33**	**0.05**	0.00
24.40	5.33	0.05	0.00
24.80	5.33	0.05	0.00
25.20	5.33	0.05	0.00
25.60	5.33	0.05	0.00
26.00	5.33	0.05	0.00
26.40	5.33	0.05	0.00
26.80	5.33	0.05	0.00
27.20	5.33	0.05	0.00
27.60	5.33	0.05	0.00
28.00	5.33	0.05	0.00
28.40	5.33	0.05	0.00
28.80	5.33	0.05	0.00
29.20	5.33	0.05	0.00
29.60	5.33	0.05	0.00
30.00	5.33	0.05	0.00

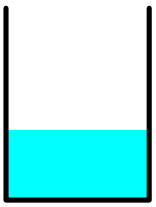
Summary for Reach 1R: 8"X8"TRENCH DRAIN

Inflow Area = 4,138 sf, 76.10% Impervious, Inflow Depth = 3.94" for 10-Year event
Inflow = 0.55 cfs @ 11.90 hrs, Volume= 1,359 cf
Outflow = 0.55 cfs @ 11.90 hrs, Volume= 1,359 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Max. Velocity= 4.56 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.3 min

Peak Storage= 2 cf @ 11.90 hrs
Average Depth at Peak Storage= 0.24'
Defined Flood Depth= 183.00' Flow Area= 91.5 sf, Capacity= 644.29 cfs
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.00 cfs

A factor of 0.75 has been applied to the discharge capacity and velocity
0.50' x 0.67' deep channel, n= 0.010 PVC, smooth interior
Length= 18.0' Slope= 0.0278 '/'
Inlet Invert= 180.33', Outlet Invert= 179.83'



Hydrograph for Reach 1R: 8"X8"TRENCH DRAIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	180.33	0.00
0.80	0.00	0	180.33	0.00
1.60	0.00	0	180.33	0.00
2.40	0.00	0	180.34	0.00
3.20	0.00	0	180.34	0.00
4.00	0.00	0	180.34	0.00
4.80	0.00	0	180.34	0.00
5.60	0.01	0	180.34	0.01
6.40	0.01	0	180.34	0.01
7.20	0.01	0	180.34	0.01
8.00	0.01	0	180.34	0.01
8.80	0.01	0	180.35	0.01
9.60	0.01	0	180.35	0.01
10.40	0.02	0	180.35	0.02
11.20	**0.03**	**0**	**180.37**	**0.03**
12.00	**0.23**	**1**	**180.46**	**0.24**
12.80	0.03	0	180.36	0.03
13.60	0.02	0	180.36	0.02
14.40	0.01	0	180.35	0.01
15.20	0.01	0	180.35	0.01
16.00	0.01	0	180.35	0.01
16.80	0.01	0	180.35	0.01
17.60	0.01	0	180.34	0.01
18.40	0.01	0	180.34	0.01
19.20	0.01	0	180.34	0.01
20.00	0.01	0	180.34	0.01
20.80	0.01	0	180.34	0.01
21.60	0.01	0	180.34	0.01
22.40	0.00	0	180.34	0.00
23.20	0.00	0	180.34	0.00
24.00	0.00	0	180.34	0.00
24.80	0.00	0	180.33	0.00
25.60	0.00	0	180.33	0.00
26.40	0.00	0	180.33	0.00
27.20	0.00	0	180.33	0.00
28.00	0.00	0	180.33	0.00
28.80	0.00	0	180.33	0.00
29.60	0.00	0	180.33	0.00

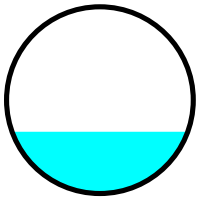
Summary for Reach 2R: 6"PVC

Inflow Area = 3,904 sf, 87.68% Impervious, Inflow Depth = 4.50" for 10-Year event
Inflow = 0.59 cfs @ 11.86 hrs, Volume= 1,464 cf
Outflow = 0.59 cfs @ 11.86 hrs, Volume= 1,464 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Max. Velocity= 10.40 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.10 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 11.86 hrs
Average Depth at Peak Storage= 0.16'
Defined Flood Depth= 182.00' Flow Area= 12.3 sf, Capacity= -3,826.91 cfs
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.51 cfs

6.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 33.0' Slope= 0.1188 '/'
Inlet Invert= 183.92', Outlet Invert= 180.00'



THESE ARE PIPE FLOW CALCULATIONS.

Hydrograph for Reach 2R: 6"PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	183.92	0.00
0.80	0.00	0	183.92	0.00
1.60	0.00	0	183.93	0.00
2.40	0.00	0	183.93	0.00
3.20	0.00	0	183.93	0.00
4.00	0.00	0	183.94	0.00
4.80	0.01	0	183.94	0.01
5.60	0.01	0	183.94	0.01
6.40	0.01	0	183.94	0.01
7.20	0.01	0	183.94	0.01
8.00	0.01	0	183.94	0.01
8.80	0.01	0	183.95	0.01
9.60	0.01	0	183.95	0.01
10.40	0.02	0	183.95	0.02
11.20	**0.04**	**0**	**183.96**	**0.04**
12.00	**0.12**	**1**	**184.00**	**0.13**
12.80	0.03	0	183.96	0.03
13.60	0.02	0	183.95	0.02
14.40	0.01	0	183.95	0.01
15.20	0.01	0	183.95	0.01
16.00	0.01	0	183.94	0.01
16.80	0.01	0	183.94	0.01
17.60	0.01	0	183.94	0.01
18.40	0.01	0	183.94	0.01
19.20	0.01	0	183.94	0.01
20.00	0.01	0	183.94	0.01
20.80	0.01	0	183.94	0.01
21.60	0.01	0	183.94	0.01
22.40	0.01	0	183.94	0.01
23.20	0.00	0	183.94	0.00
24.00	0.00	0	183.93	0.00
24.80	0.00	0	183.92	0.00
25.60	0.00	0	183.92	0.00
26.40	0.00	0	183.92	0.00
27.20	0.00	0	183.92	0.00
28.00	0.00	0	183.92	0.00
28.80	0.00	0	183.92	0.00
29.60	0.00	0	183.92	0.00

Summary for Pond 1-P: LEACH FIELD - 1

Inflow Area = 4,894 sf,100.00% Impervious, Inflow Depth = 5.09" for 10-Year event
Inflow = 0.86 cfs @ 11.89 hrs, Volume= 2,077 cf
Outflow = 0.06 cfs @ 12.49 hrs, Volume= 2,077 cf, Atten= 93%, Lag= 35.8 min
Discarded = 0.06 cfs @ 12.49 hrs, Volume= 2,077 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 185.09' @ 12.49 hrs Surf.Area= 703 sf Storage= 898 cf
Flood Elev= 190.00' Surf.Area= 930 sf Storage= 1,553 cf

Plug-Flow detention time= 141.9 min calculated for 2,071 cf (100% of inflow)
Center-of-Mass det. time= 141.6 min (879.7 - 738.1)

Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	432 cf	**Cultec R-V8** x 8 Inside #2 Effective Size= 52.6"W x 34.0"H => 8.93 sf x 7.50'L = 67.0 cf Overall Size= 54.0"W x 34.0"H x 8.00'L with 0.50' Overlap Row Length Adjustment= -5.83' x 8.93 sf x 2 rows
#2	182.00'	1,121 cf	**13.25'W x 30.00'L x 5.00'H Prismatoid Z=1.0** 3,235 cf Overall - 432 cf Embedded = 2,804 cf x 40.0% Voids
		1,553 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	182.00'	**2.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 171.00'
#2	Primary	189.00'	**2.0" x 2.0" Horiz. Orifice/Grate X 100.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.06 cfs @ 12.49 hrs HW=185.09' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=182.00' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

THE FIELD IS LARGE ENOUGH TO ABSORB RUNOFF FROM ENTIRE ROOF I.E.6960SF.

Hydrograph for Pond 1-P: LEACH FIELD - 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	182.00	0.00	0.00	**0.00**
0.80	0.00	0	182.00	0.00	0.00	0.00
1.60	0.00	1	182.01	0.00	0.00	0.00
2.40	0.00	2	182.01	0.00	0.00	0.00
3.20	0.01	3	182.02	0.01	0.01	0.00
4.00	0.01	3	182.02	0.01	0.01	0.00
4.80	0.01	4	182.03	0.01	0.01	0.00
5.60	0.01	5	182.03	0.01	0.01	0.00
6.40	0.01	5	182.03	0.01	0.01	0.00
7.20	0.01	6	182.04	0.01	0.01	0.00
8.00	0.01	7	182.04	0.01	0.01	0.00
8.80	0.02	9	182.05	0.02	0.02	0.00
9.60	0.02	10	182.06	0.02	0.02	0.00
10.40	0.03	16	182.10	0.02	0.02	0.00
11.20	**0.05**	55	182.33	0.03	0.03	0.00
12.00	**0.31**	**811**	**184.85**	**0.05**	**0.05**	0.00
12.80	0.04	**888**	**185.06**	**0.06**	**0.06**	0.00
13.60	0.03	825	184.89	0.05	0.05	0.00
14.40	0.02	738	184.65	0.05	0.05	0.00
15.20	0.02	648	184.40	0.05	0.05	0.00
16.00	0.01	557	184.14	0.05	0.05	0.00
16.80	0.01	469	183.88	0.04	0.04	0.00
17.60	0.01	385	183.64	0.04	0.04	0.00
18.40	0.01	306	183.40	0.04	0.04	0.00
19.20	0.01	231	183.17	0.03	0.03	0.00
20.00	0.01	159	182.91	0.03	0.03	0.00
20.80	0.01	95	182.56	0.03	0.03	0.00
21.60	0.01	39	182.24	0.03	0.03	0.00
22.40	0.01	5	182.03	0.01	0.01	0.00
23.20	0.01	4	182.02	0.01	0.01	0.00
24.00	0.00	3	182.02	0.01	0.01	0.00
24.80	0.00	0	182.00	0.00	0.00	0.00
25.60	0.00	0	182.00	0.00	0.00	0.00
26.40	0.00	0	182.00	0.00	0.00	0.00
27.20	0.00	0	182.00	0.00	0.00	0.00
28.00	0.00	0	182.00	0.00	0.00	0.00
28.80	0.00	0	182.00	0.00	0.00	0.00
29.60	0.00	0	182.00	0.00	0.00	0.00

Summary for Pond 2A-P: CATCH BASIN #1

Inflow Area = 3,904 sf, 87.68% Impervious, Inflow Depth = 4.50" for 10-Year event
Inflow = 0.59 cfs @ 11.86 hrs, Volume= 1,464 cf
Outflow = 0.59 cfs @ 11.86 hrs, Volume= 1,464 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.59 cfs @ 11.86 hrs, Volume= 1,464 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 185.63' @ 11.86 hrs
Flood Elev= 190.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.56 cfs @ 11.86 hrs HW=185.61' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.56 cfs @ 2.87 fps)

Hydrograph for Pond 2A-P: CATCH BASIN #1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	185.00	0.00	21.20	0.01	185.03	0.01
0.40	0.00	185.00	0.00	21.60	0.01	185.03	0.01
0.80	0.00	185.00	0.00	22.00	0.01	185.03	0.01
1.20	0.00	185.01	0.00	22.40	0.01	185.03	0.01
1.60	0.00	185.01	0.00	22.80	0.01	185.03	0.01
2.00	0.00	185.02	0.00	23.20	0.00	185.03	0.00
2.40	0.00	185.02	0.00	23.60	0.00	185.03	0.00
2.80	0.00	185.02	0.00	24.00	0.00	185.01	0.00
3.20	0.00	185.02	0.00	24.40	0.00	185.00	0.00
3.60	0.00	185.03	0.00	24.80	0.00	185.00	0.00
4.00	0.00	185.03	0.00	25.20	0.00	185.00	0.00
4.40	0.00	185.03	0.00	25.60	0.00	185.00	0.00
4.80	0.01	185.03	0.01	26.00	0.00	185.00	0.00
5.20	0.01	185.04	0.01	26.40	0.00	185.00	0.00
5.60	0.01	185.04	0.01	26.80	0.00	185.00	0.00
6.00	0.01	185.04	0.01	27.20	0.00	185.00	0.00
6.40	0.01	185.05	0.01	27.60	0.00	185.00	0.00
6.80	0.01	185.05	0.01	28.00	0.00	185.00	0.00
7.20	0.01	185.05	0.01	28.40	0.00	185.00	0.00
7.60	0.01	185.05	0.01	28.80	0.00	185.00	0.00
8.00	0.01	185.05	0.01	29.20	0.00	185.00	0.00
8.40	0.01	185.06	0.01	29.60	0.00	185.00	0.00
8.80	0.01	185.06	0.01	30.00	0.00	185.00	0.00
9.20	0.01	185.06	0.01				
9.60	0.01	185.06	0.01				
10.00	0.02	185.07	0.02				
10.40	0.02	185.08	0.02				
10.80	0.03	185.09	0.03				
11.20	0.04	185.11	0.04				
11.60	**0.16**	**185.24**	**0.16**				
12.00	**0.12**	**185.21**	**0.12**				
12.40	0.05	185.12	0.05				
12.80	0.03	185.10	0.03				
13.20	0.02	185.09	0.02				
13.60	0.02	185.08	0.02				
14.00	0.02	185.07	0.02				
14.40	0.01	185.07	0.01				
14.80	0.01	185.06	0.01				
15.20	0.01	185.06	0.01				
15.60	0.01	185.06	0.01				
16.00	0.01	185.05	0.01				
16.40	0.01	185.05	0.01				
16.80	0.01	185.05	0.01				
17.20	0.01	185.05	0.01				
17.60	0.01	185.05	0.01				
18.00	0.01	185.05	0.01				
18.40	0.01	185.05	0.01				
18.80	0.01	185.04	0.01				
19.20	0.01	185.04	0.01				
19.60	0.01	185.04	0.01				
20.00	0.01	185.04	0.01				
20.40	0.01	185.04	0.01				
20.80	0.01	185.04	0.01				

Summary for Pond 2P: LEACH FIELD-2

Inflow Area = 8,042 sf, 81.72% Impervious, Inflow Depth = 4.21" for 10-Year event
Inflow = 1.12 cfs @ 11.88 hrs, Volume= 2,822 cf
Outflow = 0.42 cfs @ 12.08 hrs, Volume= 2,822 cf, Atten= 63%, Lag= 11.8 min
Discarded = 0.11 cfs @ 12.04 hrs, Volume= 2,731 cf
Primary = 0.32 cfs @ 12.08 hrs, Volume= 91 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 182.14' @ 12.04 hrs Surf.Area= 720 sf Storage= 1,145 cf
Flood Elev= 183.00' Surf.Area= 720 sf Storage= 1,145 cf

Plug-Flow detention time= 131.3 min calculated for 2,815 cf (100% of inflow)
Center-of-Mass det. time= 130.9 min (871.6 - 740.7)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	528 cf	**Cultec R-280HD** x 12 Inside #2 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
#2	177.00'	616 cf	**12.00'W x 28.00'L x 4.00'H Prismatoid Z=1.0** 2,069 cf Overall - 528 cf Embedded = 1,541 cf x 40.0% Voids
		1,145 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.00'	**2.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 174.00'
#2	Primary	182.00'	**2.0" x 2.0" Horiz. Orifice/Grate X 100.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.10 cfs @ 12.04 hrs HW=182.00' (Free Discharge)
1=Exfiltration (Controls 0.10 cfs)

Primary OutFlow Max=0.13 cfs @ 12.08 hrs HW=182.01' (Free Discharge)
2=Orifice/Grate (Weir Controls 0.13 cfs @ 0.28 fps)

Hydrograph for Pond 2P: LEACH FIELD-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	177.00	0.00	0.00	0.00
0.80	0.00	0	177.00	0.00	0.00	0.00
1.60	0.00	1	177.01	0.00	0.00	0.00
2.40	0.01	2	177.02	0.01	0.01	0.00
3.20	0.01	3	177.02	0.01	0.01	0.00
4.00	0.01	3	177.03	0.01	0.01	0.00
4.80	0.01	4	177.03	0.01	0.01	0.00
5.60	0.01	5	177.03	0.01	0.01	0.00
6.40	0.01	5	177.04	0.01	0.01	0.00
7.20	0.02	6	177.04	0.01	0.01	0.00
8.00	0.02	7	177.05	0.02	0.02	0.00
8.80	0.02	10	177.07	0.02	0.02	0.00
9.60	0.03	21	177.15	0.02	0.02	0.00
10.40	0.04	48	177.34	0.02	0.02	0.00
11.20	**0.07**	119	177.81	0.03	0.03	0.00
12.00	**0.37**	**1,145**	**182.00**	**0.10**	**0.10**	**0.00**
12.80	0.06	1,109	**180.87**	**0.09**	**0.09**	**0.00**
13.60	0.04	1,002	180.48	0.08	0.08	0.00
14.40	0.03	879	180.01	0.07	0.07	0.00
15.20	0.02	764	179.66	0.06	0.06	0.00
16.00	0.02	654	179.35	0.06	0.06	0.00
16.80	0.02	551	179.07	0.05	0.05	0.00
17.60	0.02	457	178.82	0.05	0.05	0.00
18.40	0.01	370	178.59	0.04	0.04	0.00
19.20	0.01	289	178.37	0.04	0.04	0.00
20.00	0.01	214	178.17	0.04	0.04	0.00
20.80	0.01	144	177.96	0.03	0.03	0.00
21.60	0.01	87	177.60	0.03	0.03	0.00
22.40	0.01	43	177.31	0.02	0.02	0.00
23.20	0.01	8	177.06	0.02	0.02	0.00
24.00	0.01	3	177.02	0.01	0.01	0.00
24.80	0.00	0	177.00	0.00	0.00	0.00
25.60	0.00	0	177.00	0.00	0.00	0.00
26.40	0.00	0	177.00	0.00	0.00	0.00
27.20	0.00	0	177.00	0.00	0.00	0.00
28.00	0.00	0	177.00	0.00	0.00	0.00
28.80	0.00	0	177.00	0.00	0.00	0.00
29.60	0.00	0	177.00	0.00	0.00	0.00

LEACHINGFILED WILL BE EMPTY AFTER STORM IN LESS THAN AN HOUR.

Summary for Pond 3P: DRYWELLS

Inflow Area = 4,913 sf, 29.17% Impervious, Inflow Depth = 1.22" for 10-Year event
Inflow = 0.24 cfs @ 11.90 hrs, Volume= 498 cf
Outflow = 0.02 cfs @ 12.89 hrs, Volume= 498 cf, Atten= 93%, Lag= 59.4 min
Discarded = 0.02 cfs @ 12.89 hrs, Volume= 498 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 178.21' @ 12.89 hrs Surf.Area= 157 sf Storage= 180 cf
Flood Elev= 189.00' Surf.Area= 157 sf Storage= 447 cf

Plug-Flow detention time= 110.3 min calculated for 497 cf (100% of inflow)
Center-of-Mass det. time= 110.1 min (985.0 - 874.9)

Volume	Invert	Avail.Storage	Storage Description
#1	176.00'	278 cf	**10.00'D x 5.50'H Vertical Cone/Cylinder** x 2 864 cf Overall - 170 cf Embedded = 694 cf x 40.0% Voids
#2	177.00'	170 cf	**6.00'D x 3.00'H Vertical Cone/Cylinder** x 2 Inside #1
		447 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	176.00'	**2.500 in/hr Exfiltration over Wetted area**
#2	Primary	182.00'	**24.0" x 24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.89 hrs HW=178.21' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=176.00' (Free Discharge)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Hydrograph for Pond 3P: DRYWELLS

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	176.00	0.00	0.00	**0.00**
0.80	0.00	0	176.00	0.00	0.00	0.00
1.60	0.00	0	176.00	0.00	0.00	0.00
2.40	0.00	0	176.00	0.00	0.00	0.00
3.20	0.00	0	176.00	0.00	0.00	0.00
4.00	0.00	0	176.00	0.00	0.00	0.00
4.80	0.00	0	176.00	0.00	0.00	0.00
5.60	0.00	0	176.00	0.00	0.00	0.00
6.40	0.00	0	176.00	0.00	0.00	0.00
7.20	0.00	0	176.00	0.00	0.00	0.00
8.00	0.00	0	176.00	0.00	0.00	0.00
8.80	0.00	0	176.00	0.00	0.00	0.00
9.60	0.00	0	176.00	0.00	0.00	0.00
10.40	0.00	0	176.00	0.00	0.00	0.00
11.20	**0.00**	0	176.00	0.00	0.00	0.00
12.00	**0.08**	141	177.81	0.02	0.02	0.00
12.80	0.02	**180**	**178.21**	**0.02**	**0.02**	0.00
13.60	0.01	**174**	**178.14**	**0.02**	**0.02**	0.00
14.40	0.01	156	177.97	0.02	0.02	0.00
15.20	0.01	136	177.76	0.02	0.02	0.00
16.00	0.01	115	177.54	0.01	0.01	0.00
16.80	0.01	92	177.31	0.01	0.01	0.00
17.60	0.01	71	177.09	0.01	0.01	0.00
18.40	0.01	51	176.81	0.01	0.01	0.00
19.20	0.00	32	176.51	0.01	0.01	0.00
20.00	0.00	15	176.24	0.01	0.01	0.00
20.80	0.00	4	176.06	0.00	0.00	0.00
21.60	0.00	3	176.05	0.00	0.00	0.00
22.40	0.00	3	176.05	0.00	0.00	0.00
23.20	0.00	3	176.05	0.00	0.00	0.00
24.00	0.00	3	176.05	0.00	0.00	0.00
24.80	0.00	0	176.00	0.00	0.00	0.00
25.60	0.00	0	176.00	0.00	0.00	0.00
26.40	0.00	0	176.00	0.00	0.00	0.00
27.20	0.00	0	176.00	0.00	0.00	0.00
28.00	0.00	0	176.00	0.00	0.00	0.00
28.80	0.00	0	176.00	0.00	0.00	0.00
29.60	0.00	0	176.00	0.00	0.00	0.00

Summary for Pond 4P: DISCARDED

Inflow Area = 3,103 sf, 66.58% Impervious, Inflow Depth = 3.41" for 10-Year event
Inflow = 0.36 cfs @ 11.89 hrs, Volume= 881 cf
Primary = 0.36 cfs @ 11.89 hrs, Volume= 881 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs

Hydrograph for Pond 4P: DISCARDED

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00		0.00	21.20	0.00		0.00
0.40	0.00		0.00	21.60	0.00		0.00
0.80	0.00		0.00	22.00	0.00		0.00
1.20	0.00		0.00	22.40	0.00		0.00
1.60	0.00		0.00	22.80	0.00		0.00
2.00	0.00		0.00	23.20	0.00		0.00
2.40	0.00		0.00	23.60	0.00		0.00
2.80	0.00		0.00	24.00	0.00		0.00
3.20	0.00		0.00	24.40	0.00		0.00
3.60	0.00		0.00	24.80	0.00		0.00
4.00	0.00		0.00	25.20	0.00		0.00
4.40	0.00		0.00	25.60	0.00		0.00
4.80	0.00		0.00	26.00	0.00		0.00
5.20	0.00		0.00	26.40	0.00		0.00
5.60	0.00		0.00	26.80	0.00		0.00
6.00	0.00		0.00	27.20	0.00		0.00
6.40	0.00		0.00	27.60	0.00		0.00
6.80	0.00		0.00	28.00	0.00		0.00
7.20	0.00		0.00	28.40	0.00		0.00
7.60	0.01		0.01	28.80	0.00		0.00
8.00	0.01		0.01	29.20	0.00		0.00
8.40	0.01		0.01	29.60	0.00		0.00
8.80	0.01		0.01	30.00	0.00		0.00
9.20	0.01		0.01				
9.60	0.01		0.01				
10.00	0.01		0.01				
10.40	0.01		0.01				
10.80	0.02		0.02				
11.20	0.02		0.02				
11.60	**0.08**		**0.08**				
12.00	**0.13**		**0.13**				
12.40	0.03		0.03				
12.80	0.02		0.02				
13.20	0.01		0.01				
13.60	0.01		0.01				
14.00	0.01		0.01				
14.40	0.01		0.01				
14.80	0.01		0.01				
15.20	0.01		0.01				
15.60	0.01		0.01				
16.00	0.01		0.01				
16.40	0.01		0.01				
16.80	0.01		0.01				
17.20	0.01		0.01				
17.60	0.00		0.00				
18.00	0.00		0.00				
18.40	0.00		0.00				
18.80	0.00		0.00				
19.20	0.00		0.00				
19.60	0.00		0.00				
20.00	0.00		0.00				
20.40	0.00		0.00				
20.80	0.00		0.00				

Time span=0.00-30.00 hrs, dt=0.08 hrs, 376 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A-S: ROOF DISCARDED Runoff Area=2,066 sf 100.00% Impervious Runoff Depth=8.11"
Flow Length=102' Slope=0.0050 '/' Tc=3.5 min CN=98 Runoff=0.40 cfs 1,396 cf

Subcatchment 1S: ROOF Runoff Area=4,894 sf 100.00% Impervious Runoff Depth=8.11"
Flow Length=102' Slope=0.0050 '/' Tc=3.5 min CN=98 Runoff=0.94 cfs 3,308 cf

Subcatchment 2S: Parking+Drive(WS1) Runoff Area=3,423 sf 100.00% Impervious Runoff Depth=8.11"
Flow Length=103' Tc=1.8 min CN=98 Runoff=0.68 cfs 2,313 cf

Subcatchment 3S: LAWN-WS3 Runoff Area=481 sf 0.00% Impervious Runoff Depth=1.31"
Flow Length=28' Slope=0.0200 '/' Tc=3.4 min CN=39 Runoff=0.01 cfs 52 cf

Subcatchment 4S: PARKING+DRIVE(WS2) Runoff Area=3,149 sf 100.00% Impervious Runoff Depth=8.11"
Flow Length=95' Tc=3.9 min CN=98 Runoff=0.60 cfs 2,128 cf

Subcatchment 5S: LAWN-WS4 Runoff Area=989 sf 0.00% Impervious Runoff Depth=1.31"
Flow Length=28' Slope=0.0200 '/' Tc=3.4 min CN=39 Runoff=0.02 cfs 108 cf

Subcatchment 6S: LAWN+PATHS-WS6 Runoff Area=4,913 sf 29.17% Impervious Runoff Depth=3.14"
Flow Length=20' Slope=0.0200 '/' Tc=2.6 min CN=56 Runoff=0.43 cfs 1,285 cf

Subcatchment 7S: UNDISTURBEDGREEN - WS5 Runoff Area=1,037 sf 0.00% Impervious Runoff Depth=0.66"
Flow Length=9' Slope=0.0350 '/' Tc=1.1 min CN=32 Runoff=0.01 cfs 57 cf

Reach 1R: 8"X8"TRENCH DRAIN Avg. Flow Depth=0.26' Max Vel=4.70 fps Inflow=0.62 cfs 2,236 cf
x 0.75 n=0.010 L=18.0' S=0.0278 '/' Capacity=2.00 cfs Outflow=0.61 cfs 2,236 cf

Reach 2R: 6"PVC Avg. Flow Depth=0.18' Max Vel=10.93 fps Inflow=0.69 cfs 2,366 cf
6.0" Round Pipe n=0.010 L=33.0' S=0.1188 '/' Capacity=2.51 cfs Outflow=0.69 cfs 2,366 cf

Pond 1-P: LEACH FIELD - 1 Peak Elev=186.75' Storage=1,463 cf Inflow=0.94 cfs 3,308 cf
Discarded=0.08 cfs 3,308 cf Primary=0.00 cfs 0 cf Outflow=0.08 cfs 3,308 cf

Pond 2A-P: CATCH BASIN #1 Peak Elev=185.79' Inflow=0.69 cfs 2,366 cf
Outflow=0.69 cfs 2,366 cf

Pond 2P: LEACH FIELD-2 Peak Elev=182.03' Storage=1,145 cf Inflow=1.30 cfs 4,602 cf
Discarded=0.10 cfs 3,642 cf Primary=1.30 cfs 960 cf Outflow=1.40 cfs 4,602 cf

Pond 3P: DRYWELLS Peak Elev=182.01' Storage=447 cf Inflow=0.43 cfs 1,285 cf
Discarded=0.03 cfs 1,136 cf Primary=0.18 cfs 149 cf Outflow=0.21 cfs 1,285 cf

Pond 4P: DISCARDED Inflow=0.40 cfs 1,454 cf
Primary=0.40 cfs 1,454 cf

Total Runoff Area = 20,952 sf Runoff Volume = 10,648 cf Average Runoff Depth = 6.10"
28.57% Pervious = 5,987 sf 71.43% Impervious = 14,965 sf

Summary for Subcatchment 1A-S: ROOF DISCARDED

Runoff = 0.40 cfs @ 12.01 hrs, Volume= 1,396 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 100-Year Rainfall=8.35"

Area (sf)	CN	Description
2,066	98	Paved parking & roofs
2,066		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	32	0.0050	0.65		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
0.3	35	0.0050	2.11	0.29	**Pipe Channel, gutter** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.011 Steel, smooth
2.4	35	0.0050	0.24	0.05	**Pipe Channel, Drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.110
3.5	102	Total			

Hydrograph for Subcatchment 1A-S: ROOF DISCARDED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.03	0.00	0.00
0.80	0.07	0.00	0.00
1.20	0.10	0.01	0.00
1.60	0.13	0.03	0.00
2.00	0.17	0.05	0.00
2.40	0.20	0.07	0.00
2.80	0.24	0.10	0.00
3.20	0.28	0.13	0.00
3.60	0.32	0.16	0.00
4.00	0.36	0.19	0.00
4.40	0.40	0.23	0.00
4.80	0.45	0.27	0.01
5.20	0.50	0.32	0.01
5.60	0.55	0.36	0.01
6.00	0.60	0.41	0.01
6.40	0.66	0.46	0.01
6.80	0.72	0.52	0.01
7.20	0.79	0.59	0.01
7.60	0.87	0.66	0.01
8.00	0.95	0.74	0.01
8.40	1.05	0.84	0.01
8.80	1.16	0.94	0.01
9.20	1.28	1.07	0.02
9.60	1.42	1.20	0.02
10.00	1.58	1.36	0.02
10.40	1.76	1.53	0.02
10.80	1.97	1.74	0.03
11.20	2.22	2.00	0.04
11.60	2.62	2.39	0.08
12.00	4.17	3.94	**0.40**
12.40	5.73	5.49	0.09
12.80	6.13	5.89	0.04
13.20	6.38	6.14	0.03
13.60	6.59	6.35	0.02
14.00	6.77	6.53	0.02
14.40	6.93	6.69	0.02
14.80	7.07	6.83	0.02
15.20	7.19	6.95	0.01
15.60	7.30	7.06	0.01
16.00	7.40	7.16	0.01
16.40	7.48	7.24	0.01
16.80	7.56	7.32	0.01
17.20	7.63	7.39	0.01
17.60	7.69	7.45	0.01
18.00	7.75	7.51	0.01
18.40	7.80	7.56	0.01
18.80	7.85	7.61	0.01
19.20	7.90	7.66	0.01
19.60	7.95	7.71	0.01
20.00	7.99	7.75	0.01
20.40	8.03	7.79	0.01
20.80	8.07	7.83	0.00
21.20	8.11	7.87	0.00
21.60	8.15	7.91	0.00
22.00	8.19	7.95	0.00
22.40	8.22	7.98	0.00
22.80	8.26	8.02	0.00
23.20	8.29	8.05	0.00
23.60	8.32	8.08	0.00
24.00	**8.35**	**8.11**	0.00
24.40	8.35	8.11	0.00
24.80	8.35	8.11	0.00
25.20	8.35	8.11	0.00
25.60	8.35	8.11	0.00
26.00	8.35	8.11	0.00
26.40	8.35	8.11	0.00
26.80	8.35	8.11	0.00
27.20	8.35	8.11	0.00
27.60	8.35	8.11	0.00
28.00	8.35	8.11	0.00
28.40	8.35	8.11	0.00
28.80	8.35	8.11	0.00
29.20	8.35	8.11	0.00
29.60	8.35	8.11	0.00
30.00	8.35	8.11	0.00

Summary for Subcatchment 1S: ROOF

Runoff = 0.94 cfs @ 12.01 hrs, Volume= 3,308 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 100-Year Rainfall=8.35"

Area (sf)	CN	Description
4,894	98	Paved parking & roofs
4,894		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	32	0.0050	0.65		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
0.3	35	0.0050	2.11	0.29	**Pipe Channel, gutter** 5.0" Round Area= 0.1 sf Perim= 1.3' r= 0.10' n= 0.011 Steel, smooth
2.4	35	0.0050	0.24	0.05	**Pipe Channel, Drain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.110
3.5	102	Total			

Hydrograph for Subcatchment 1S: ROOF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.03	0.00	0.00
0.80	0.07	0.00	0.00
1.20	0.10	0.01	0.00
1.60	0.13	0.03	0.00
2.00	0.17	0.05	0.01
2.40	0.20	0.07	0.01
2.80	0.24	0.10	0.01
3.20	0.28	0.13	0.01
3.60	0.32	0.16	0.01
4.00	0.36	0.19	0.01
4.40	0.40	0.23	0.01
4.80	0.45	0.27	0.01
5.20	0.50	0.32	0.01
5.60	0.55	0.36	0.01
6.00	0.60	0.41	0.01
6.40	0.66	0.46	0.02
6.80	0.72	0.52	0.02
7.20	0.79	0.59	0.02
7.60	0.87	0.66	0.02
8.00	0.95	0.74	0.02
8.40	1.05	0.84	0.03
8.80	1.16	0.94	0.03
9.20	1.28	1.07	0.04
9.60	1.42	1.20	0.04
10.00	1.58	1.36	0.05
10.40	1.76	1.53	0.05
10.80	1.97	1.74	0.06
11.20	2.22	2.00	0.08
11.60	2.62	2.39	0.18
12.00	4.17	3.94	**0.94**
12.40	5.73	5.49	0.21
12.80	6.13	5.89	0.09
13.20	6.38	6.14	0.06
13.60	6.59	6.35	0.06
14.00	6.77	6.53	0.05
14.40	6.93	6.69	0.04
14.80	7.07	6.83	0.04
15.20	7.19	6.95	0.03
15.60	7.30	7.06	0.03
16.00	7.40	7.16	0.02
16.40	7.48	7.24	0.02
16.80	7.56	7.32	0.02
17.20	7.63	7.39	0.02
17.60	7.69	7.45	0.02
18.00	7.75	7.51	0.02
18.40	7.80	7.56	0.01
18.80	7.85	7.61	0.01
19.20	7.90	7.66	0.01
19.60	7.95	7.71	0.01
20.00	7.99	7.75	0.01
20.40	8.03	7.79	0.01
20.80	8.07	7.83	0.01
21.20	8.11	7.87	0.01
21.60	8.15	7.91	0.01
22.00	8.19	7.95	0.01
22.40	8.22	7.98	0.01
22.80	8.26	8.02	0.01
23.20	8.29	8.05	0.01
23.60	8.32	8.08	0.01
24.00	**8.35**	**8.11**	0.01
24.40	8.35	8.11	0.00
24.80	8.35	8.11	0.00
25.20	8.35	8.11	0.00
25.60	8.35	8.11	0.00
26.00	8.35	8.11	0.00
26.40	8.35	8.11	0.00
26.80	8.35	8.11	0.00
27.20	8.35	8.11	0.00
27.60	8.35	8.11	0.00
28.00	8.35	8.11	0.00
28.40	8.35	8.11	0.00
28.80	8.35	8.11	0.00
29.20	8.35	8.11	0.00
29.60	8.35	8.11	0.00
30.00	8.35	8.11	0.00

Summary for Subcatchment 2S: Parking+Drive (WS1)

Runoff = 0.68 cfs @ 11.99 hrs, Volume= 2,313 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 100-Year Rainfall=8.35"

Area (sf)	CN	Description
3,423	98	Paved parking & roofs
3,423		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	70	0.0350	1.65		**Sheet Flow, Paved Area** Smooth surfaces n= 0.011 P2= 3.40"
1.1	33	0.1700	0.50	0.01	**Pipe Channel, Drain** 6.0" Round w/ 5.0" inside fill Area= 0.0 sf Perim= 0.8' r= 0.03' n= 0.110
1.8	103	Total			

Hydrograph for Subcatchment 2S: Parking+Drive (WS1)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.03	0.00	0.00
0.80	0.07	0.00	0.00
1.20	0.10	0.01	0.00
1.60	0.13	0.03	0.00
2.00	0.17	0.05	0.00
2.40	0.20	0.07	0.00
2.80	0.24	0.10	0.01
3.20	0.28	0.13	0.01
3.60	0.32	0.16	0.01
4.00	0.36	0.19	0.01
4.40	0.40	0.23	0.01
4.80	0.45	0.27	0.01
5.20	0.50	0.32	0.01
5.60	0.55	0.36	0.01
6.00	0.60	0.41	0.01
6.40	0.66	0.46	0.01
6.80	0.72	0.52	0.01
7.20	0.79	0.59	0.01
7.60	0.87	0.66	0.02
8.00	0.95	0.74	0.02
8.40	1.05	0.84	0.02
8.80	1.16	0.94	0.02
9.20	1.28	1.07	0.03
9.60	1.42	1.20	0.03
10.00	1.58	1.36	0.03
10.40	1.76	1.53	0.04
10.80	1.97	1.74	0.04
11.20	2.22	2.00	0.06
11.60	2.62	2.39	0.14
12.00	4.17	3.94	**0.68**
12.40	5.73	5.49	0.13
12.80	6.13	5.89	0.06
13.20	6.38	6.14	0.04
13.60	6.59	6.35	0.04
14.00	6.77	6.53	0.03
14.40	6.93	6.69	0.03
14.80	7.07	6.83	0.03
15.20	7.19	6.95	0.02
15.60	7.30	7.06	0.02
16.00	7.40	7.16	0.02
16.40	7.48	7.24	0.02
16.80	7.56	7.32	0.01
17.20	7.63	7.39	0.01
17.60	7.69	7.45	0.01
18.00	7.75	7.51	0.01
18.40	7.80	7.56	0.01
18.80	7.85	7.61	0.01
19.20	7.90	7.66	0.01
19.60	7.95	7.71	0.01
20.00	7.99	7.75	0.01
20.40	8.03	7.79	0.01
20.80	8.07	7.83	0.01
21.20	8.11	7.87	0.01
21.60	8.15	7.91	0.01
22.00	8.19	7.95	0.01
22.40	8.22	7.98	0.01
22.80	8.26	8.02	0.01
23.20	8.29	8.05	0.01
23.60	8.32	8.08	0.01
24.00	**8.35**	**8.11**	0.00
24.40	8.35	8.11	0.00
24.80	8.35	8.11	0.00
25.20	8.35	8.11	0.00
25.60	8.35	8.11	0.00
26.00	8.35	8.11	0.00
26.40	8.35	8.11	0.00
26.80	8.35	8.11	0.00
27.20	8.35	8.11	0.00
27.60	8.35	8.11	0.00
28.00	8.35	8.11	0.00
28.40	8.35	8.11	0.00
28.80	8.35	8.11	0.00
29.20	8.35	8.11	0.00
29.60	8.35	8.11	0.00
30.00	8.35	8.11	0.00

Summary for Subcatchment 3S: LAWN-WS3

Runoff = 0.01 cfs @ 12.05 hrs, Volume= 52 cf, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 100-Year Rainfall=8.35"

Area (sf)	CN	Description
481	39	>75% Grass cover, Good, HSG A
481		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	28	0.0200	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 3S: LAWN-WS3

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.03	0.00	0.00
0.80	0.07	0.00	0.00
1.20	0.10	0.00	0.00
1.60	0.13	0.00	0.00
2.00	0.17	0.00	0.00
2.40	0.20	0.00	0.00
2.80	0.24	0.00	0.00
3.20	0.28	0.00	0.00
3.60	0.32	0.00	0.00
4.00	0.36	0.00	0.00
4.40	0.40	0.00	0.00
4.80	0.45	0.00	0.00
5.20	0.50	0.00	0.00
5.60	0.55	0.00	0.00
6.00	0.60	0.00	0.00
6.40	0.66	0.00	0.00
6.80	0.72	0.00	0.00
7.20	0.79	0.00	0.00
7.60	0.87	0.00	0.00
8.00	0.95	0.00	0.00
8.40	1.05	0.00	0.00
8.80	1.16	0.00	0.00
9.20	1.28	0.00	0.00
9.60	1.42	0.00	0.00
10.00	1.58	0.00	0.00
10.40	1.76	0.00	0.00
10.80	1.97	0.00	0.00
11.20	2.22	0.00	0.00
11.60	2.62	0.00	0.00
12.00	4.17	0.07	**0.01**
12.40	5.73	0.37	**0.01**
12.80	6.13	0.48	0.00
13.20	6.38	0.56	0.00
13.60	6.59	0.63	0.00
14.00	6.77	0.69	0.00
14.40	6.93	0.74	0.00
14.80	7.07	0.79	0.00
15.20	7.19	0.84	0.00
15.60	7.30	0.88	0.00
16.00	7.40	0.92	0.00
16.40	7.48	0.95	0.00
16.80	7.56	0.98	0.00
17.20	7.63	1.01	0.00
17.60	7.69	1.03	0.00
18.00	7.75	1.05	0.00
18.40	7.80	1.07	0.00
18.80	7.85	1.10	0.00
19.20	7.90	1.12	0.00
19.60	7.95	1.13	0.00
20.00	7.99	1.15	0.00
20.40	8.03	1.17	0.00
20.80	8.07	1.19	0.00
21.20	8.11	1.21	0.00
21.60	8.15	1.22	0.00
22.00	8.19	1.24	0.00
22.40	8.22	1.25	0.00
22.80	8.26	1.27	0.00
23.20	8.29	1.28	0.00
23.60	8.32	1.29	0.00
24.00	**8.35**	**1.31**	0.00
24.40	8.35	1.31	0.00
24.80	8.35	1.31	0.00
25.20	8.35	1.31	0.00
25.60	8.35	1.31	0.00
26.00	8.35	1.31	0.00
26.40	8.35	1.31	0.00
26.80	8.35	1.31	0.00
27.20	8.35	1.31	0.00
27.60	8.35	1.31	0.00
28.00	8.35	1.31	0.00
28.40	8.35	1.31	0.00
28.80	8.35	1.31	0.00
29.20	8.35	1.31	0.00
29.60	8.35	1.31	0.00
30.00	8.35	1.31	0.00

Summary for Subcatchment 4S: PARKING+ DRIVE(WS2)

Runoff = 0.60 cfs @ 12.01 hrs, Volume= 2,128 cf, Depth= 8.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 100-Year Rainfall=8.35"

Area (sf)	CN	Description
3,149	98	Paved parking & roofs
3,149		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	70	0.0700	2.18		**Sheet Flow, SHEET FLOW** Smooth surfaces n= 0.011 P2= 3.40"
3.4	25	0.0100	0.12	0.00	**Pipe Channel, Drain** 6.0" Round w/ 5.0" inside fill Area= 0.0 sf Perim= 0.8' r= 0.03' n= 0.110
3.9	95	Total			

Hydrograph for Subcatchment 4S: PARKING+ DRIVE(WS2)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.03	0.00	0.00
0.80	0.07	0.00	0.00
1.20	0.10	0.01	0.00
1.60	0.13	0.03	0.00
2.00	0.17	0.05	0.00
2.40	0.20	0.07	0.00
2.80	0.24	0.10	0.01
3.20	0.28	0.13	0.01
3.60	0.32	0.16	0.01
4.00	0.36	0.19	0.01
4.40	0.40	0.23	0.01
4.80	0.45	0.27	0.01
5.20	0.50	0.32	0.01
5.60	0.55	0.36	0.01
6.00	0.60	0.41	0.01
6.40	0.66	0.46	0.01
6.80	0.72	0.52	0.01
7.20	0.79	0.59	0.01
7.60	0.87	0.66	0.01
8.00	0.95	0.74	0.02
8.40	1.05	0.84	0.02
8.80	1.16	0.94	0.02
9.20	1.28	1.07	0.02
9.60	1.42	1.20	0.03
10.00	1.58	1.36	0.03
10.40	1.76	1.53	0.03
10.80	1.97	1.74	0.04
11.20	2.22	2.00	0.05
11.60	2.62	2.39	0.11
12.00	4.17	3.94	**0.59**
12.40	5.73	5.49	0.14
12.80	6.13	5.89	0.06
13.20	6.38	6.14	0.04
13.60	6.59	6.35	0.04
14.00	6.77	6.53	0.03
14.40	6.93	6.69	0.03
14.80	7.07	6.83	0.02
15.20	7.19	6.95	0.02
15.60	7.30	7.06	0.02
16.00	7.40	7.16	0.02
16.40	7.48	7.24	0.01
16.80	7.56	7.32	0.01
17.20	7.63	7.39	0.01
17.60	7.69	7.45	0.01
18.00	7.75	7.51	0.01
18.40	7.80	7.56	0.01
18.80	7.85	7.61	0.01
19.20	7.90	7.66	0.01
19.60	7.95	7.71	0.01
20.00	7.99	7.75	0.01
20.40	8.03	7.79	0.01
20.80	8.07	7.83	0.01
21.20	8.11	7.87	0.01
21.60	8.15	7.91	0.01
22.00	8.19	7.95	0.01
22.40	8.22	7.98	0.01
22.80	8.26	8.02	0.01
23.20	8.29	8.05	0.01
23.60	8.32	8.08	0.01
24.00	**8.35**	**8.11**	0.00
24.40	8.35	8.11	0.00
24.80	8.35	8.11	0.00
25.20	8.35	8.11	0.00
25.60	8.35	8.11	0.00
26.00	8.35	8.11	0.00
26.40	8.35	8.11	0.00
26.80	8.35	8.11	0.00
27.20	8.35	8.11	0.00
27.60	8.35	8.11	0.00
28.00	8.35	8.11	0.00
28.40	8.35	8.11	0.00
28.80	8.35	8.11	0.00
29.20	8.35	8.11	0.00
29.60	8.35	8.11	0.00
30.00	8.35	8.11	0.00

Summary for Subcatchment 5S: LAWN-WS4

Runoff = 0.02 cfs @ 12.05 hrs, Volume= 108 cf, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 100-Year Rainfall=8.35"

Area (sf)	CN	Description
989	39	>75% Grass cover, Good, HSG A
989		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	28	0.0200	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 5S: LAWN-WS4

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.03	0.00	0.00
0.80	0.07	0.00	0.00
1.20	0.10	0.00	0.00
1.60	0.13	0.00	0.00
2.00	0.17	0.00	0.00
2.40	0.20	0.00	0.00
2.80	0.24	0.00	0.00
3.20	0.28	0.00	0.00
3.60	0.32	0.00	0.00
4.00	0.36	0.00	0.00
4.40	0.40	0.00	0.00
4.80	0.45	0.00	0.00
5.20	0.50	0.00	0.00
5.60	0.55	0.00	0.00
6.00	0.60	0.00	0.00
6.40	0.66	0.00	0.00
6.80	0.72	0.00	0.00
7.20	0.79	0.00	0.00
7.60	0.87	0.00	0.00
8.00	0.95	0.00	0.00
8.40	1.05	0.00	0.00
8.80	1.16	0.00	0.00
9.20	1.28	0.00	0.00
9.60	1.42	0.00	0.00
10.00	1.58	0.00	0.00
10.40	1.76	0.00	0.00
10.80	1.97	0.00	0.00
11.20	2.22	0.00	0.00
11.60	2.62	0.00	0.00
12.00	4.17	0.07	**0.02**
12.40	5.73	0.37	**0.01**
12.80	6.13	0.48	0.01
13.20	6.38	0.56	0.00
13.60	6.59	0.63	0.00
14.00	6.77	0.69	0.00
14.40	6.93	0.74	0.00
14.80	7.07	0.79	0.00
15.20	7.19	0.84	0.00
15.60	7.30	0.88	0.00
16.00	7.40	0.92	0.00
16.40	7.48	0.95	0.00
16.80	7.56	0.98	0.00
17.20	7.63	1.01	0.00
17.60	7.69	1.03	0.00
18.00	7.75	1.05	0.00
18.40	7.80	1.07	0.00
18.80	7.85	1.10	0.00
19.20	7.90	1.12	0.00
19.60	7.95	1.13	0.00
20.00	7.99	1.15	0.00
20.40	8.03	1.17	0.00
20.80	8.07	1.19	0.00
21.20	8.11	1.21	0.00
21.60	8.15	1.22	0.00
22.00	8.19	1.24	0.00
22.40	8.22	1.25	0.00
22.80	8.26	1.27	0.00
23.20	8.29	1.28	0.00
23.60	8.32	1.29	0.00
24.00	**8.35**	**1.31**	0.00
24.40	8.35	1.31	0.00
24.80	8.35	1.31	0.00
25.20	8.35	1.31	0.00
25.60	8.35	1.31	0.00
26.00	8.35	1.31	0.00
26.40	8.35	1.31	0.00
26.80	8.35	1.31	0.00
27.20	8.35	1.31	0.00
27.60	8.35	1.31	0.00
28.00	8.35	1.31	0.00
28.40	8.35	1.31	0.00
28.80	8.35	1.31	0.00
29.20	8.35	1.31	0.00
29.60	8.35	1.31	0.00
30.00	8.35	1.31	0.00

Summary for Subcatchment 6S: LAWN+PATHS-WS6

Runoff = 0.43 cfs @ 12.01 hrs, Volume= 1,285 cf, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 100-Year Rainfall=8.35"

Area (sf)	CN	Description
3,480	39	>75% Grass cover, Good, HSG A
1,433	98	Paved parking & roofs
4,913	56	Weighted Average
3,480		70.83% Pervious Area
1,433		29.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	20	0.0200	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 6S: LAWN+PATHS-WS6

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.03	0.00	0.00
0.80	0.07	0.00	0.00
1.20	0.10	0.00	0.00
1.60	0.13	0.00	0.00
2.00	0.17	0.00	0.00
2.40	0.20	0.00	0.00
2.80	0.24	0.00	0.00
3.20	0.28	0.00	0.00
3.60	0.32	0.00	0.00
4.00	0.36	0.00	0.00
4.40	0.40	0.00	0.00
4.80	0.45	0.00	0.00
5.20	0.50	0.00	0.00
5.60	0.55	0.00	0.00
6.00	0.60	0.00	0.00
6.40	0.66	0.00	0.00
6.80	0.72	0.00	0.00
7.20	0.79	0.00	0.00
7.60	0.87	0.00	0.00
8.00	0.95	0.00	0.00
8.40	1.05	0.00	0.00
8.80	1.16	0.00	0.00
9.20	1.28	0.00	0.00
9.60	1.42	0.00	0.00
10.00	1.58	0.00	0.00
10.40	1.76	0.00	0.00
10.80	1.97	0.02	0.01
11.20	2.22	0.05	0.01
11.60	2.62	0.12	0.04
12.00	4.17	0.65	**0.43**
12.40	5.73	1.44	0.11
12.80	6.13	1.67	0.05
13.20	6.38	1.83	0.04
13.60	6.59	1.96	0.03
14.00	6.77	2.07	0.03
14.40	6.93	2.17	0.03
14.80	7.07	2.26	0.02
15.20	7.19	2.35	0.02
15.60	7.30	2.42	0.02
16.00	7.40	2.48	0.02
16.40	7.48	2.54	0.02
16.80	7.56	2.59	0.01
17.20	7.63	2.64	0.01
17.60	7.69	2.68	0.01
18.00	7.75	2.72	0.01
18.40	7.80	2.76	0.01
18.80	7.85	2.79	0.01
19.20	7.90	2.82	0.01
19.60	7.95	2.86	0.01
20.00	7.99	2.89	0.01
20.40	8.03	2.92	0.01
20.80	8.07	2.95	0.01
21.20	8.11	2.97	0.01
21.60	8.15	3.00	0.01
22.00	8.19	3.03	0.01
22.40	8.22	3.05	0.01
22.80	8.26	3.07	0.01
23.20	8.29	3.10	0.01
23.60	8.32	3.12	0.01
24.00	**8.35**	**3.14**	0.00
24.40	8.35	3.14	0.00
24.80	8.35	3.14	0.00
25.20	8.35	3.14	0.00
25.60	8.35	3.14	0.00
26.00	8.35	3.14	0.00
26.40	8.35	3.14	0.00
26.80	8.35	3.14	0.00
27.20	8.35	3.14	0.00
27.60	8.35	3.14	0.00
28.00	8.35	3.14	0.00
28.40	8.35	3.14	0.00
28.80	8.35	3.14	0.00
29.20	8.35	3.14	0.00
29.60	8.35	3.14	0.00
30.00	8.35	3.14	0.00

Summary for Subcatchment 7S: UNDISTURBED GREEN - WS5

Runoff = 0.01 cfs @ 12.22 hrs, Volume= 57 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Type III 24-hr 100-Year Rainfall=8.35"

Area (sf)	CN	Description
1,037	32	Woods/grass comb., Good, HSG A
1,037		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	9	0.0350	0.14		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.40"

Hydrograph for Subcatchment 7S: UNDISTURBED GREEN - WS5

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.40	0.03	0.00	0.00
0.80	0.07	0.00	0.00
1.20	0.10	0.00	0.00
1.60	0.13	0.00	0.00
2.00	0.17	0.00	0.00
2.40	0.20	0.00	0.00
2.80	0.24	0.00	0.00
3.20	0.28	0.00	0.00
3.60	0.32	0.00	0.00
4.00	0.36	0.00	0.00
4.40	0.40	0.00	0.00
4.80	0.45	0.00	0.00
5.20	0.50	0.00	0.00
5.60	0.55	0.00	0.00
6.00	0.60	0.00	0.00
6.40	0.66	0.00	0.00
6.80	0.72	0.00	0.00
7.20	0.79	0.00	0.00
7.60	0.87	0.00	0.00
8.00	0.95	0.00	0.00
8.40	1.05	0.00	0.00
8.80	1.16	0.00	0.00
9.20	1.28	0.00	0.00
9.60	1.42	0.00	0.00
10.00	1.58	0.00	0.00
10.40	1.76	0.00	0.00
10.80	1.97	0.00	0.00
11.20	2.22	0.00	0.00
11.60	2.62	0.00	0.00
12.00	4.17	0.00	**0.00**
12.40	5.73	0.10	**0.00**
12.80	6.13	0.15	0.00
13.20	6.38	0.19	0.00
13.60	6.59	0.23	0.00
14.00	6.77	0.27	0.00
14.40	6.93	0.30	0.00
14.80	7.07	0.33	0.00
15.20	7.19	0.36	0.00
15.60	7.30	0.38	0.00
16.00	7.40	0.41	0.00
16.40	7.48	0.43	0.00
16.80	7.56	0.45	0.00
17.20	7.63	0.46	0.00
17.60	7.69	0.48	0.00
18.00	7.75	0.49	0.00
18.40	7.80	0.51	0.00
18.80	7.85	0.52	0.00
19.20	7.90	0.54	0.00
19.60	7.95	0.55	0.00
20.00	7.99	0.56	0.00
20.40	8.03	0.57	0.00
20.80	8.07	0.58	0.00
21.20	8.11	0.59	0.00
21.60	8.15	0.61	0.00
22.00	8.19	0.62	0.00
22.40	8.22	0.63	0.00
22.80	8.26	0.64	0.00
23.20	8.29	0.65	0.00
23.60	8.32	0.65	0.00
24.00	**8.35**	**0.66**	0.00
24.40	8.35	0.66	0.00
24.80	8.35	0.66	0.00
25.20	8.35	0.66	0.00
25.60	8.35	0.66	0.00
26.00	8.35	0.66	0.00
26.40	8.35	0.66	0.00
26.80	8.35	0.66	0.00
27.20	8.35	0.66	0.00
27.60	8.35	0.66	0.00
28.00	8.35	0.66	0.00
28.40	8.35	0.66	0.00
28.80	8.35	0.66	0.00
29.20	8.35	0.66	0.00
29.60	8.35	0.66	0.00
30.00	8.35	0.66	0.00

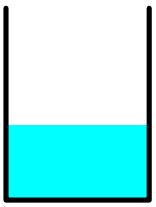
Summary for Reach 1R: 8"X8"TRENCH DRAIN

Inflow Area = 4,138 sf, 76.10% Impervious, Inflow Depth = 6.48" for 100-Year event
Inflow = 0.62 cfs @ 12.01 hrs, Volume= 2,236 cf
Outflow = 0.61 cfs @ 12.02 hrs, Volume= 2,236 cf, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Max. Velocity= 4.70 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 12.02 hrs
Average Depth at Peak Storage= 0.26'
Defined Flood Depth= 183.00' Flow Area= 91.5 sf, Capacity= 644.29 cfs
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 2.00 cfs

A factor of 0.75 has been applied to the discharge capacity and velocity
0.50' x 0.67' deep channel, n= 0.010 PVC, smooth interior
Length= 18.0' Slope= 0.0278 '/'
Inlet Invert= 180.33', Outlet Invert= 179.83'



Hydrograph for Reach 1R: 8"X8"TRENCH DRAIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	180.33	0.00
0.80	0.00	0	180.33	0.00
1.60	0.00	0	180.34	0.00
2.40	0.00	0	180.34	0.00
3.20	0.01	0	180.34	0.01
4.00	0.01	0	180.34	0.01
4.80	0.01	0	180.34	0.01
5.60	0.01	0	180.35	0.01
6.40	0.01	0	180.35	0.01
7.20	0.01	0	180.35	0.01
8.00	0.02	0	180.35	0.02
8.80	0.02	0	180.36	0.02
9.60	0.03	0	180.36	0.03
10.40	0.03	0	180.37	0.03
11.20	0.05	0	180.38	0.05
12.00	**0.61**	**2**	**180.59**	**0.61**
12.80	0.06	0	180.38	0.06
13.60	0.04	0	180.37	0.04
14.40	0.03	0	180.36	0.03
15.20	0.02	0	180.36	0.02
16.00	0.02	0	180.35	0.02
16.80	0.02	0	180.35	0.02
17.60	0.01	0	180.35	0.01
18.40	0.01	0	180.35	0.01
19.20	0.01	0	180.35	0.01
20.00	0.01	0	180.35	0.01
20.80	0.01	0	180.35	0.01
21.60	0.01	0	180.34	0.01
22.40	0.01	0	180.34	0.01
23.20	0.01	0	180.34	0.01
24.00	0.00	0	180.34	0.00
24.80	0.00	0	180.33	0.00
25.60	0.00	0	180.33	0.00
26.40	0.00	0	180.33	0.00
27.20	0.00	0	180.33	0.00
28.00	0.00	0	180.33	0.00
28.80	0.00	0	180.33	0.00
29.60	0.00	0	180.33	0.00

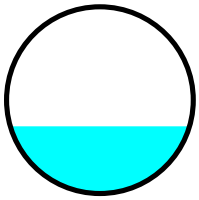
Summary for Reach 2R: 6"PVC

Inflow Area = 3,904 sf, 87.68% Impervious, Inflow Depth = 7.27" for 100-Year event
Inflow = 0.69 cfs @ 11.99 hrs, Volume= 2,366 cf
Outflow = 0.69 cfs @ 11.99 hrs, Volume= 2,366 cf, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Max. Velocity= 10.93 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.62 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 11.99 hrs
Average Depth at Peak Storage= 0.18'
Defined Flood Depth= 182.00' Flow Area= 12.3 sf, Capacity= -3,826.91 cfs
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.51 cfs

6.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 33.0' Slope= 0.1188 '/'
Inlet Invert= 183.92', Outlet Invert= 180.00'



Hydrograph for Reach 2R: 6"PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	183.92	0.00
0.80	0.00	0	183.93	0.00
1.60	0.00	0	183.93	0.00
2.40	0.00	0	183.94	0.00
3.20	0.01	0	183.94	0.01
4.00	0.01	0	183.94	0.01
4.80	0.01	0	183.94	0.01
5.60	0.01	0	183.94	0.01
6.40	0.01	0	183.94	0.01
7.20	0.01	0	183.95	0.01
8.00	0.02	0	183.95	0.02
8.80	0.02	0	183.95	0.02
9.60	0.03	0	183.96	0.03
10.40	0.04	0	183.96	0.04
11.20	0.06	0	183.97	0.06
12.00	**0.69**	**2**	**184.10**	**0.69**
12.80	0.06	0	183.97	0.06
13.60	0.04	0	183.96	0.04
14.40	0.03	0	183.96	0.03
15.20	0.02	0	183.95	0.02
16.00	0.02	0	183.95	0.02
16.80	0.02	0	183.95	0.02
17.60	0.01	0	183.95	0.01
18.40	0.01	0	183.94	0.01
19.20	0.01	0	183.94	0.01
20.00	0.01	0	183.94	0.01
20.80	0.01	0	183.94	0.01
21.60	0.01	0	183.94	0.01
22.40	0.01	0	183.94	0.01
23.20	0.01	0	183.94	0.01
24.00	0.00	0	183.93	0.00
24.80	0.00	0	183.92	0.00
25.60	0.00	0	183.92	0.00
26.40	0.00	0	183.92	0.00
27.20	0.00	0	183.92	0.00
28.00	0.00	0	183.92	0.00
28.80	0.00	0	183.92	0.00
29.60	0.00	0	183.92	0.00

Summary for Pond 1-P: LEACH FIELD - 1

Inflow Area = 4,894 sf,100.00% Impervious, Inflow Depth = 8.11" for 100-Year event
Inflow = 0.94 cfs @ 12.01 hrs, Volume= 3,308 cf
Outflow = 0.08 cfs @ 12.87 hrs, Volume= 3,308 cf, Atten= 91%, Lag= 51.9 min
Discarded = 0.08 cfs @ 12.87 hrs, Volume= 3,308 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 186.75' @ 12.87 hrs Surf.Area= 899 sf Storage= 1,463 cf
Flood Elev= 190.00' Surf.Area= 930 sf Storage= 1,553 cf

Plug-Flow detention time= 195.0 min calculated for 3,308 cf (100% of inflow)
Center-of-Mass det. time= 194.7 min (930.7 - 736.0)

Volume	Invert	Avail.Storage	Storage Description
#1	183.00'	432 cf	**Cultec R-V8** x 8 Inside #2 Effective Size= 52.6"W x 34.0"H => 8.93 sf x 7.50'L = 67.0 cf Overall Size= 54.0"W x 34.0"H x 8.00'L with 0.50' Overlap Row Length Adjustment= -5.83' x 8.93 sf x 2 rows
#2	182.00'	1,121 cf	**13.25'W x 30.00'L x 5.00'H Prismatoid Z=1.0** 3,235 cf Overall - 432 cf Embedded = 2,804 cf x 40.0% Voids
		1,553 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	182.00'	**2.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 171.00'
#2	Primary	189.00'	**2.0" x 2.0" Horiz. Orifice/Grate X 100.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.08 cfs @ 12.87 hrs HW=186.75' (Free Discharge)
1=Exfiltration (Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=182.00' (Free Discharge)
2=Orifice/Grate (Controls 0.00 cfs)

Hydrograph for Pond 1-P: LEACH FIELD - 1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	182.00	0.00	0.00	**0.00**
0.80	0.00	1	182.00	0.00	0.00	0.00
1.60	0.00	2	182.02	0.00	0.00	0.00
2.40	0.01	3	182.02	0.01	0.01	0.00
3.20	0.01	5	182.03	0.01	0.01	0.00
4.00	0.01	5	182.03	0.01	0.01	0.00
4.80	0.01	6	182.04	0.01	0.01	0.00
5.60	0.01	7	182.04	0.01	0.01	0.00
6.40	0.02	8	182.05	0.02	0.02	0.00
7.20	0.02	10	182.06	0.02	0.02	0.00
8.00	0.02	12	182.08	0.02	0.02	0.00
8.80	0.03	24	182.15	0.02	0.02	0.00
9.60	0.04	57	182.35	0.03	0.03	0.00
10.40	0.05	112	182.66	0.03	0.03	0.00
11.20	0.08	209	183.10	0.03	0.03	0.00
12.00	**0.94**	848	184.95	0.06	0.06	0.00
12.80	0.09	**1,463**	**186.75**	**0.08**	**0.08**	0.00
13.60	0.06	**1,423**	**186.64**	**0.08**	**0.08**	0.00
14.40	0.04	1,336	186.39	0.08	0.08	0.00
15.20	0.03	1,233	186.08	0.07	0.07	0.00
16.00	0.02	1,119	185.73	0.07	0.07	0.00
16.80	0.02	1,001	185.38	0.06	0.06	0.00
17.60	0.02	886	185.06	0.06	0.06	0.00
18.40	0.01	772	184.74	0.05	0.05	0.00
19.20	0.01	665	184.44	0.05	0.05	0.00
20.00	0.01	565	184.16	0.05	0.05	0.00
20.80	0.01	472	183.89	0.04	0.04	0.00
21.60	0.01	386	183.64	0.04	0.04	0.00
22.40	0.01	304	183.39	0.04	0.04	0.00
23.20	0.01	228	183.16	0.03	0.03	0.00
24.00	0.01	157	182.89	0.03	0.03	0.00
24.80	0.00	73	182.44	0.03	0.03	0.00
25.60	0.00	5	182.03	0.01	0.01	0.00
26.40	0.00	0	182.00	0.00	0.00	0.00
27.20	0.00	0	182.00	0.00	0.00	0.00
28.00	0.00	0	182.00	0.00	0.00	0.00
28.80	0.00	0	182.00	0.00	0.00	0.00
29.60	0.00	0	182.00	0.00	0.00	0.00

Summary for Pond 2A-P: CATCH BASIN #1

Inflow Area = 3,904 sf, 87.68% Impervious, Inflow Depth = 7.27" for 100-Year event
Inflow = 0.69 cfs @ 11.99 hrs, Volume= 2,366 cf
Outflow = 0.69 cfs @ 11.99 hrs, Volume= 2,366 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.69 cfs @ 11.99 hrs, Volume= 2,366 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 185.79' @ 12.00 hrs
Flood Elev= 190.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	185.00'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.68 cfs @ 11.99 hrs HW=185.76' (Free Discharge)
1=Orifice/Grate (Orifice Controls 0.68 cfs @ 3.45 fps)

Hydrograph for Pond 2A-P: CATCH BASIN #1

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	185.00	0.00
0.40	0.00	185.00	0.00
0.80	0.00	185.01	0.00
1.20	0.00	185.02	0.00
1.60	0.00	185.02	0.00
2.00	0.00	185.03	0.00
2.40	0.00	185.03	0.00
2.80	0.01	185.04	0.01
3.20	0.01	185.04	0.01
3.60	0.01	185.04	0.01
4.00	0.01	185.05	0.01
4.40	0.01	185.05	0.01
4.80	0.01	185.05	0.01
5.20	0.01	185.05	0.01
5.60	0.01	185.05	0.01
6.00	0.01	185.05	0.01
6.40	0.01	185.06	0.01
6.80	0.01	185.06	0.01
7.20	0.01	185.06	0.01
7.60	0.02	185.07	0.02
8.00	0.02	185.07	0.02
8.40	0.02	185.08	0.02
8.80	0.02	185.08	0.02
9.20	0.03	185.09	0.03
9.60	0.03	185.10	0.03
10.00	0.03	185.10	0.03
10.40	0.04	185.11	0.04
10.80	0.04	185.12	0.04
11.20	0.06	185.14	0.06
11.60	0.14	185.23	0.14
12.00	**0.69**	**185.79**	**0.69**
12.40	0.14	185.22	0.14
12.80	0.06	185.15	0.06
13.20	0.05	185.12	0.05
13.60	0.04	185.11	0.04
14.00	0.03	185.11	0.03
14.40	0.03	185.10	0.03
14.80	0.03	185.09	0.03
15.20	0.02	185.09	0.02
15.60	0.02	185.08	0.02
16.00	0.02	185.07	0.02
16.40	0.02	185.07	0.02
16.80	0.02	185.07	0.02
17.20	0.01	185.06	0.01
17.60	0.01	185.06	0.01
18.00	0.01	185.06	0.01
18.40	0.01	185.06	0.01
18.80	0.01	185.06	0.01
19.20	0.01	185.05	0.01
19.60	0.01	185.05	0.01
20.00	0.01	185.05	0.01
20.40	0.01	185.05	0.01
20.80	0.01	185.05	0.01
21.20	0.01	185.05	0.01
21.60	0.01	185.05	0.01
22.00	0.01	185.05	0.01
22.40	0.01	185.05	0.01
22.80	0.01	185.04	0.01
23.20	0.01	185.04	0.01
23.60	0.01	185.04	0.01
24.00	0.00	185.01	0.00
24.40	0.00	185.00	0.00
24.80	0.00	185.00	0.00
25.20	0.00	185.00	0.00
25.60	0.00	185.00	0.00
26.00	0.00	185.00	0.00
26.40	0.00	185.00	0.00
26.80	0.00	185.00	0.00
27.20	0.00	185.00	0.00
27.60	0.00	185.00	0.00
28.00	0.00	185.00	0.00
28.40	0.00	185.00	0.00
28.80	0.00	185.00	0.00
29.20	0.00	185.00	0.00
29.60	0.00	185.00	0.00
30.00	0.00	185.00	0.00

Summary for Pond 2P: LEACH FIELD-2

Inflow Area = 8,042 sf, 81.72% Impervious, Inflow Depth = 6.87" for 100-Year event
Inflow = 1.30 cfs @ 12.00 hrs, Volume= 4,602 cf
Outflow = 1.40 cfs @ 12.06 hrs, Volume= 4,602 cf, Atten= 0%, Lag= 3.6 min
Discarded = 0.10 cfs @ 12.08 hrs, Volume= 3,642 cf
Primary = 1.30 cfs @ 12.06 hrs, Volume= 960 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 182.03' @ 12.08 hrs Surf.Area= 720 sf Storage= 1,145 cf
Flood Elev= 183.00' Surf.Area= 720 sf Storage= 1,145 cf

Plug-Flow detention time= 117.9 min calculated for 4,589 cf (100% of inflow)
Center-of-Mass det. time= 117.8 min (859.1 - 741.3)

Volume	Invert	Avail.Storage	Storage Description
#1	178.00'	528 cf	**Cultec R-280HD** x 12 Inside #2 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
#2	177.00'	616 cf	**12.00'W x 28.00'L x 4.00'H Prismatoid Z=1.0** 2,069 cf Overall - 528 cf Embedded = 1,541 cf x 40.0% Voids
		1,145 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	177.00'	**2.500 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 174.00'
#2	Primary	182.00'	**2.0" x 2.0" Horiz. Orifice/Grate X 100.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.10 cfs @ 12.08 hrs HW=182.03' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.10 cfs)

Primary OutFlow Max=0.94 cfs @ 12.06 hrs HW=182.03' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.94 cfs @ 0.53 fps)

960CU FT OF OVERFLOW WILL MAKE A 2" DEEP PUDDLE IN THE GARAGE FLOOR AND WILL DISSIPATE BACK IN THE LEACHING FIELD IN A PERIOD OF 14 HOURS AFTER THE STORM.
SIMILARLY IF THE ROOF RUNOFF CONTRIBUTES TO THIS PUDDLE, THE ADDITIONAL DEPTH WILL BE 3" AND WILL DISSIPATE IN ADDITIONAL 21 HOURS.
OVERALL, THE FIELD WILL BE EMPTY IN LESS THAN 72 HOURS.
THIS CAN HAPPEN WITH 1% CHANCES OF ANY YEAR I.E. IT MAY HAPPEN ONLY ONCE IN 100 YEARS.

Hydrograph for Pond 2P: LEACH FIELD-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	177.00	0.00	0.00	0.00
0.80	0.00	1	177.01	0.00	0.00	0.00
1.60	0.01	3	177.02	0.01	0.01	0.00
2.40	0.01	4	177.03	0.01	0.01	0.00
3.20	0.01	5	177.03	0.01	0.01	0.00
4.00	0.01	5	177.04	0.01	0.01	0.00
4.80	0.02	6	177.05	0.02	0.02	0.00
5.60	0.02	7	177.05	0.02	0.02	0.00
6.40	0.02	8	177.06	0.02	0.02	0.00
7.20	0.03	18	177.13	0.02	0.02	0.00
8.00	0.03	39	177.28	0.02	0.02	0.00
8.80	0.04	76	177.53	0.03	0.03	0.00
9.60	0.06	134	177.90	0.03	0.03	0.00
10.40	0.07	215	178.17	0.04	0.04	0.00
11.20	0.11	355	178.55	0.04	0.04	0.00
12.00	**1.29**	**1,145**	**182.02**	**0.82**	**0.10**	**0.71**
12.80	0.12	1,145	**182.00**	**0.11**	**0.10**	**0.01**
13.60	0.08	1,138	180.98	0.09	0.09	0.00
14.40	0.06	1,082	180.78	0.09	0.09	0.00
15.20	0.05	1,001	180.48	0.08	0.08	0.00
16.00	0.04	905	180.11	0.07	0.07	0.00
16.80	0.03	804	179.78	0.07	0.07	0.00
17.60	0.02	704	179.49	0.06	0.06	0.00
18.40	0.02	605	179.22	0.05	0.05	0.00
19.20	0.02	513	178.97	0.05	0.05	0.00
20.00	0.02	429	178.75	0.05	0.05	0.00
20.80	0.02	352	178.54	0.04	0.04	0.00
21.60	0.02	281	178.35	0.04	0.04	0.00
22.40	0.01	215	178.17	0.04	0.04	0.00
23.20	0.01	153	178.01	0.03	0.03	0.00
24.00	0.01	98	177.67	0.03	0.03	0.00
24.80	0.00	26	177.19	0.02	0.02	0.00
25.60	0.00	0	177.00	0.00	0.00	0.00
26.40	0.00	0	177.00	0.00	0.00	0.00
27.20	0.00	0	177.00	0.00	0.00	0.00
28.00	0.00	0	177.00	0.00	0.00	0.00
28.80	0.00	0	177.00	0.00	0.00	0.00
29.60	0.00	0	177.00	0.00	0.00	0.00

Summary for Pond 3P: DRYWELLS

Inflow Area = 4,913 sf, 29.17% Impervious, Inflow Depth = 3.14" for 100-Year event
Inflow = 0.43 cfs @ 12.01 hrs, Volume= 1,285 cf
Outflow = 0.21 cfs @ 12.32 hrs, Volume= 1,285 cf, Atten= 50%, Lag= 18.8 min
Discarded = 0.03 cfs @ 12.32 hrs, Volume= 1,136 cf
Primary = 0.18 cfs @ 12.32 hrs, Volume= 149 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs
Peak Elev= 182.01' @ 12.32 hrs Surf.Area= 157 sf Storage= 447 cf
Flood Elev= 189.00' Surf.Area= 157 sf Storage= 447 cf

Plug-Flow detention time= 183.1 min calculated for 1,285 cf (100% of inflow)
Center-of-Mass det. time= 182.9 min (1,030.2 - 847.3)

Volume	Invert	Avail.Storage	Storage Description
#1	176.00'	278 cf	**10.00'D x 5.50'H Vertical Cone/Cylinder** x 2 864 cf Overall - 170 cf Embedded = 694 cf x 40.0% Voids
#2	177.00'	170 cf	**6.00'D x 3.00'H Vertical Cone/Cylinder** x 2 Inside #1
		447 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	176.00'	**2.500 in/hr Exfiltration over Wetted area**
#2	Primary	182.00'	**24.0" x 24.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 12.32 hrs HW=182.01' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.05 cfs @ 12.32 hrs HW=182.01' (Free Discharge)
↑**2=Orifice/Grate** (Weir Controls 0.05 cfs @ 0.33 fps)

Hydrograph for Pond 3P: DRYWELLS

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	176.00	0.00	0.00	0.00
0.80	0.00	0	176.00	0.00	0.00	0.00
1.60	0.00	0	176.00	0.00	0.00	0.00
2.40	0.00	0	176.00	0.00	0.00	0.00
3.20	0.00	0	176.00	0.00	0.00	0.00
4.00	0.00	0	176.00	0.00	0.00	0.00
4.80	0.00	0	176.00	0.00	0.00	0.00
5.60	0.00	0	176.00	0.00	0.00	0.00
6.40	0.00	0	176.00	0.00	0.00	0.00
7.20	0.00	0	176.00	0.00	0.00	0.00
8.00	0.00	0	176.00	0.00	0.00	0.00
8.80	0.00	0	176.00	0.00	0.00	0.00
9.60	0.00	0	176.00	0.00	0.00	0.00
10.40	0.00	1	176.02	0.00	0.00	0.00
11.20	0.01	7	176.12	0.01	0.01	0.00
12.00	**0.43**	**222**	**178.64**	**0.02**	**0.02**	**0.00**
12.80	0.05	**447**	**182.00**	**0.06**	**0.03**	**0.03**
13.60	0.03	447	182.00	0.04	0.03	0.01
14.40	0.03	446	181.48	0.03	0.03	0.00
15.20	0.02	435	181.30	0.03	0.03	0.00
16.00	0.02	411	180.91	0.03	0.03	0.00
16.80	0.01	380	180.42	0.03	0.03	0.00
17.60	0.01	347	179.94	0.02	0.02	0.00
18.40	0.01	312	179.58	0.02	0.02	0.00
19.20	0.01	278	179.23	0.02	0.02	0.00
20.00	0.01	246	178.89	0.02	0.02	0.00
20.80	0.01	215	178.58	0.02	0.02	0.00
21.60	0.01	186	178.27	0.02	0.02	0.00
22.40	0.01	158	177.99	0.02	0.02	0.00
23.20	0.01	132	177.71	0.02	0.02	0.00
24.00	0.00	106	177.45	0.01	0.01	0.00
24.80	0.00	67	177.05	0.01	0.01	0.00
25.60	0.00	33	176.52	0.01	0.01	0.00
26.40	0.00	5	176.08	0.01	0.01	0.00
27.20	0.00	0	176.00	0.00	0.00	0.00
28.00	0.00	0	176.00	0.00	0.00	0.00
28.80	0.00	0	176.00	0.00	0.00	0.00
29.60	0.00	0	176.00	0.00	0.00	0.00

Summary for Pond 4P: DISCARDED

Inflow Area = 3,103 sf, 66.58% Impervious, Inflow Depth = 5.62" for 100-Year event
Inflow = 0.40 cfs @ 12.01 hrs, Volume= 1,454 cf
Primary = 0.40 cfs @ 12.01 hrs, Volume= 1,454 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.08 hrs

THIS VOLUME OF THE ROOF RUNOFF EQUAL TO THE EXISTING ROOF IS ACTUALLY SENT TO THE LEACHING FIELD #1.
IT WILL BE ADDED TO OVERFLOW IN 100 YEAR STORM ONLY.
THE VOLUME 1454 CU FT WILL DISSIPATE IN THE FIELD AFTER THE STORM IN ABOUT 18 HOURS OR LESS.
IT WILL ALSO MAY FLOW IN TO THE CATCHBASIN 1 AND ADD TO THE PUDDLE IN THE GARAGE ABOVE THE LEACHING FIELD #2.
THIS WAY IT IS ACTUALLY NOT LEAVING THE SITE. BUT IT WILL DISSIPATE IN THE LEACHING FIELD #2 AS WELL.

Hydrograph for Pond 4P: DISCARDED

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00		0.00	21.20	0.01		0.01
0.40	0.00		0.00	21.60	0.01		0.01
0.80	0.00		0.00	22.00	0.00		0.00
1.20	0.00		0.00	22.40	0.00		0.00
1.60	0.00		0.00	22.80	0.00		0.00
2.00	0.00		0.00	23.20	0.00		0.00
2.40	0.00		0.00	23.60	0.00		0.00
2.80	0.00		0.00	24.00	0.00		0.00
3.20	0.00		0.00	24.40	0.00		0.00
3.60	0.00		0.00	24.80	0.00		0.00
4.00	0.00		0.00	25.20	0.00		0.00
4.40	0.00		0.00	25.60	0.00		0.00
4.80	0.01		0.01	26.00	0.00		0.00
5.20	0.01		0.01	26.40	0.00		0.00
5.60	0.01		0.01	26.80	0.00		0.00
6.00	0.01		0.01	27.20	0.00		0.00
6.40	0.01		0.01	27.60	0.00		0.00
6.80	0.01		0.01	28.00	0.00		0.00
7.20	0.01		0.01	28.40	0.00		0.00
7.60	0.01		0.01	28.80	0.00		0.00
8.00	0.01		0.01	29.20	0.00		0.00
8.40	0.01		0.01	29.60	0.00		0.00
8.80	0.01		0.01	30.00	0.00		0.00
9.20	0.02		0.02				
9.60	0.02		0.02				
10.00	0.02		0.02				
10.40	0.02		0.02				
10.80	0.03		0.03				
11.20	0.04		0.04				
11.60	0.08		0.08				
12.00	**0.40**		**0.40**				
12.40	0.09		0.09				
12.80	0.04		0.04				
13.20	0.03		0.03				
13.60	0.03		0.03				
14.00	0.02		0.02				
14.40	0.02		0.02				
14.80	0.02		0.02				
15.20	0.02		0.02				
15.60	0.01		0.01				
16.00	0.01		0.01				
16.40	0.01		0.01				
16.80	0.01		0.01				
17.20	0.01		0.01				
17.60	0.01		0.01				
18.00	0.01		0.01				
18.40	0.01		0.01				
18.80	0.01		0.01				
19.20	0.01		0.01				
19.60	0.01		0.01				
20.00	0.01		0.01				
20.40	0.01		0.01				
20.80	0.01		0.01				

Project:	42 SUMMER ST	Intensity>>	100 yr	8.35	in
	MAYNARD MA		25 yr	6.25	in
Owner:	MacDONALD DEVELOPMENT		10 yr	5.33	in
			2 yr	3.43	in

Hydrology Calculations - Post Developement **Drywell for driveway**

Slope of culvert / pipe		0.50%	n=	0.013		
Flow capacity of size(D")	8	1.036	cfs	464.441	gpm	
Slope of culvert / pipe		2.00%				
Flow capacity of size(D")	8	2.072	cfs	928.882	gpm	
Flow capacity of size(D")	6	0.961	cfs	430.897	gpm	

Project:	42 SUMMER ST	Intensity>>	100 yr	8.35 in
	MAYNARD MA		25 yr	
Owner:	MacDONALD DEVELOPMENT		10 yr	5.33 in
			2 yr	3.43 in

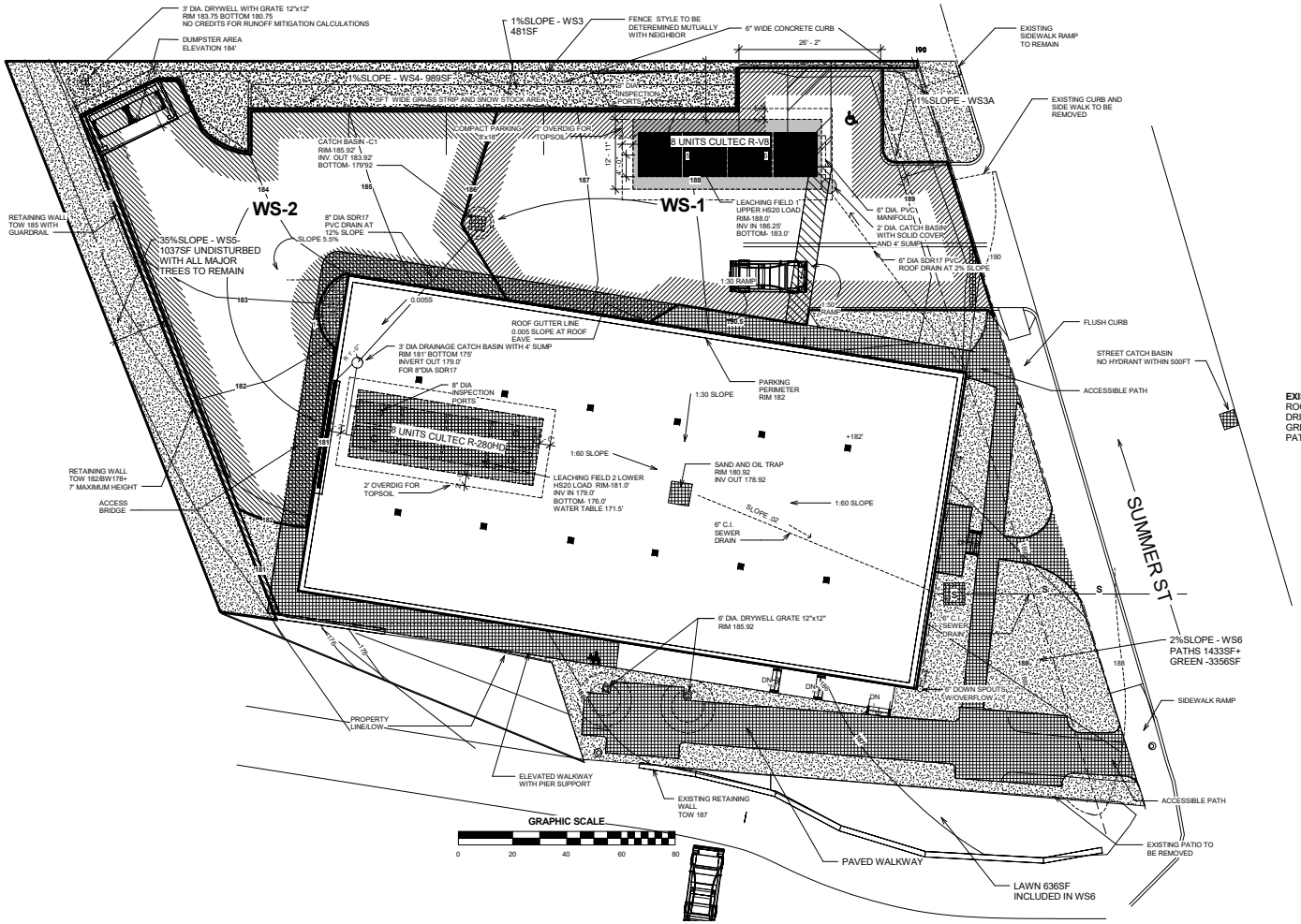
Hydrology Calculations - Post Developement **Drywell for driveway**

100 yr storm - Assuming the field is FULL at the end of storm:

drawdown of leach field-1		perc in/hr	2.5	
cf	1463		15.62	hours
sf	899		93.65	cf/hr avg

drawdown of leach field-2		perc in/hr	2.5	
cf	1145		15.27	hours
sf	720		75	cf/hr avg

POST DEVELOPMENT WATERSHEDS



PARKING 36 SPACES
8 OUTSIDE
28 INSIDE

24 UNITS

LOT AREA	**20,952 SF**
ROOF AREA	**6,960 SF**
OUTSIDE PARKING	**6,285 SF**
ROOF of SIDEWALK	**714 SF**
GREEN AREA	6,440 SF [0.24]
SIDE WALK AREA	1,194 SF

BUILDING GROSS AREA (2.5 FLOORS)	18,000 SF
BUILDING HEIGHT - FRONT	32.5+/- FEET
HANDICAP 1/25	2 SPACES
# OF UNITS @ 800/SF LOT AREA	22.5
# OF UNITS @ 1500/SF LOT AREA	12
PROPOSED UNITS	24
# OF PARKING SPACES REQD @ 1 1/2 /UNIT	36 SPACES

FAR 0.86

WS-1	3,423 SF	/ 5%
WS-2	3,149 SF	/ 8%
WS-3	481 SF	/ 1%
WS-4	989 SF	/ 1%
WS-5	1,037 SF	/35%
WS-6	4,913 SF	/ 2%
TOTAL WS	13,992 SF	

EXISTING		PROPOSED		CHANGE	
ROOF	2,066 SF	ROOF	6,960 SF	ROOF	+4,894 SF
DRIVEWAY	6,082 SF	DRIVEWAY	6,725 SF	DRIVEWAY	+ 643 SF
GREEN	8,148	GREEN	4,600 SF	GREEN	-3,548 SF
PATHS -	NONE	PATHS	1,433 SF	PATHS	+1,433 SF

LALA ASSOCIATES ENGINEERS LLC

TSS REMOVAL WORKSHEETS

42 SUMMER STREET, MA

PROPOSED CUSTOM HOME

PREPARED BY
Kanayo Lala / Sanjay Kaul
4/18/2019

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

EXCEEDS 44% PRETREATMENT
FOR THE WATER QUALITY RECHARGE

Location: 42 SUMMER STREET, MAYNARD, MA - DRIVE-PRE

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Street Sweeping - 5%	0.05	1.00	0.05	0.95
Trench Drain with Sump acting as Sediment Forebay	0.25	0.95	0.24	0.71
Deep Sump and Hooded Catch Basin	0.25	0.71	0.18	0.53
	0.00	0.53	0.00	0.53
	0.00	0.53	0.00	0.53

Total TSS Removal = 47%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: CULTEC 2 FIELD
Prepared By: KANAYO LALA
Date: 6/7/2019

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: 42 SUMMER STREET, MAYNARD, MA - DRIVEWAY

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Infiltration Basin	**0.80**	**1.00**	**0.80**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: CULTEC 2 FIELD
Prepared By: KANAYO LALA
Date: 6/7/2019

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: 42 SUMMER STREET, MAYNARD, MA - ROOF

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Infiltration Basin	**0.80**	**0.75**	**0.60**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**

Total TSS Removal = **85%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: LEACHING FIELD 1
Prepared By: KL/SK
Date: 4/18/2019

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

LALA ASSOCIATES ENGINEERS LLC

OPERATIONS AND MAINTENANCE PLAN

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42 SUMMER STREET, MA

PROPOSED CUSTOM HOME

PREPARED BY
Kanayo Lala / Sanjay Kaul
4/18/2019

OPERATION AND MAINTENANCE PLAN

INTRODUCTION :

Considerable time, effort and cost has been spent in the design and construction of the stormwater management system for the development. The stormwater management system consists of a number of Best Management Practices (BMP's). These BMP's combine to ensure that storm runoff from site will not damage the sensitive environmental resources surrounding the site. In order to ensure that these BMP's operate as designed it is very important that the procedure in the operation and maintenance plan be followed. Most of these operation procedures require observation and measurement; however at certain times more extensive maintenance measures my be needed. The following is an itemization of each of these BMP's and their maintenance needs.

The Party responsible for maintenance should contract with a maintenance organization capable of performing the more extensive measures such as pumping of catch basin sumps, etc.

BMP No.1 Paved Road Surface/Parking Lot Area :

Regularly pick up and remove litter from the parking lot area, landscaped islands and perimeter landscaped areas and water quality areas.

The paved area is to be swept a minimum of four times per year, at least once during April and again during September with a high efficiency vacuum sweeper or a regenerative air sweeper. If a mechanical sweeper is used, the paved area is to be swept a minimum of once a month.

BMP No.2 -Catch Basins :

Once per month inspect the Catch Basins to ensure that it is operating correctly using the dipstick tube provided to measure the sediment depth. Also measure the oil depth.

When the oil depth is greater than 4" the entire liquid volume shall be pumped from the catch basin units. Oil is pumped through the top grate cover.

BMP No. 3 Subsurface Recharge :

The inlet pipe and infiltration basins (leaching fields) shall be inspected on half yearly basis. Any accumulated debris shall be removed.

Inspect recharge facilities following a rainfall event greater that 2.5 inches in a 24 hour period.

If standing water is observed for more than 48 hours following a storm event, immediately retain a qualified professional to assess whether infiltration function has been lost and develop recommended corrective actions.

Inlet and outlet structures:

On a regular basis the inlet pipe and outlet structure shall be checked for debris and removed as necessary to ensure unobstructed flow of water through the recharge chambers. Impoundment embankments and outlet structures should be inspected at least once annually by a qualified professional for structural integrity and for any condition which should adversely affect their function.

Twice per year (Spring and Fall) remulch where needed, grass shall be mowed, tress and shrubs shall be inspected, pruned and repaired to evaluate their health. Remove any dead or severely diseased vegetation. Diseased vegetation should be treated as necessary using preventative and low toxic measure to the extent possible.

Once every 2 years, during the spring, replace the mulch of the entire area. Remove old mulch before new mulch is distributed.

Apply an alkaline product such as limestone once to two times per year to counteract soil acidity resulting from acidic precipitation and runoff. Before applying limestone, determine the PH of the soil to determine quantity of limestone needed.

CONSTRUCTION PHASE - EROSION CONTROL & MAINTENANCE
Person Responsible : James MacDonald, 10 Main Street, Maynard, MA – 781 307 1684

1. As per the construction schedule of 20 months, the 1st month will provide the erosion control fence and wattle rolls at the limit of work along all property lines.
2. The excavation will be done for the rear retaining wall and the wall will be built.
3. The erosion control drainage swale will be prepared as the backfill progresses.
4. This will follow the removal of paving and demolition of the existing house. The site slopes to back at average 3% grade shedding all its runoff to the drainage swale.
5. The swale and the west side green strip will be seeded with the seed mix for the period of 20 months.
6. The growing plants will stabilize the swale.
7. The east side easement strip will be mulched and will remain accessible to utility company during construction.
8. During the construction period the swale will be maintained green and remain clear and no staging will be done over it.
9. The two leaching fields will be installed following the building foundation.

10. After the roof of the building is completed in about 5th month the roof runoff will be diverted to the upper leaching filed. The site runoff will continue to drain to the swale.
11. The swale will be backfilled to allow paving.
12. The site will be paved in the 18th month. The driveway runoff will be diverted to the catch basin grate and trench drain.
13. The extra wattle rolesand 25ft fo silt fence will be stored at sire for emergency repair in heavy storm id any of the silt fence is compromised.

STORMWATER MANAGEMENT REPORT
42 SUMMER STREET
MAYNARD, MASSACHUSETTS

INSPECTION REPORT:

Inspection Firm : _____

Inspectors Name : _____ Date : _____

Components Inspected : _____

_____

Signed : _____

SYSTEM MAINTENANCE:

Maintenance Firm : _____ Date : _____

Catchbasins Cleaned: Yes ____ No ____ Comments : _____

_____

Trench Drains Cleaned: Yes ____ No ____ Comments _____

_____

Drain Manholes Cleaned : Yes ____ No ____ Comments : _____

_____

Drainlines Inspected Yes ____ No ____ Comments : _____

_____

Infiltration System(s) Cleaned : Yes ____ No ____ Comments : _____

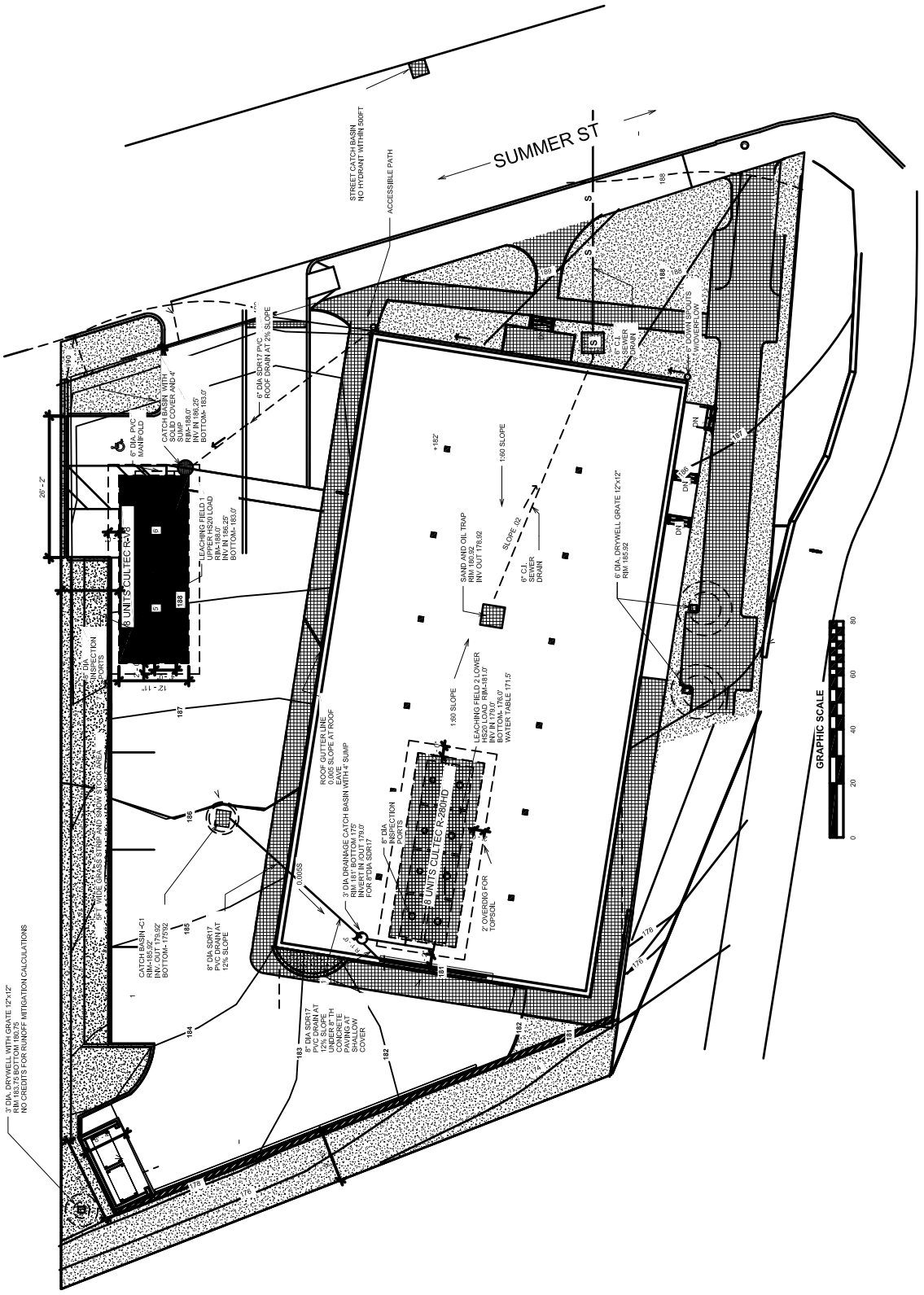
_____

Estimate of Material Removed : _____

Other Comments : _____

_____

Signed : _____



PROJECT/OWNER:		TITLE:
MAYNARD POINT 42 SUMMER STREET MAYNARD, MA 01754	LALA ASSOCIATES ENGINEERS LLC 37 OLD VILLAGE ROAD, ACTON, MA LIC. 40460-C (EXP.6/30/20) 978 337 5252 / lalaengineers@gmail.com	BMP LOCATION PLAN

MacDonald Developement, 42 Summer Street, Maynard , MA

STORM WATER MANAGEMENT BEST MANAGEMENT PRACTICES – INSPECTION SCHEDULE AND EVALUATION CHECKLIST

BEST MANAGEMENT PRACTICE	INSPECTION FREQUENCY (1)	DATE	INSPECTOR	MINIMUM MAINTENANCE & KEY ITEMS TO CHECK (1)	CLEANING REPAIR NEEDED YES__NO__	DATE OF CLEANING/ REPAIR	PERFORMED BY
PARKING LOT SWEEPING							
Catch Basins & Trench Drain							
Sand & Oil Trap							
CULTEC CHAMBERS							
SNOW MANANGEMENT							
GREEN AREAS							
DRYWELLS							

(1)Refer to the Operation & Maintenance Plan for recommendations regarding frequency of inspections and maintenance of BMP's

Recommendations regarding frequency for inspection and maintenance of specific BMPs.

STORMWATER CONTROL MANAGER / ENVIRONMENTAL MONITOR: STAMP / SIGNATURE

LANDSCAPE MAINTENANCE PLAN

Maynard Point
42 Summer Street
Maynard, MA 01754

1. Replacement of failed plant material shall be the responsibility of the owner, Maynard Point, LLC, and work preformed by MacDonald Property Management, LLC.
2. Funding for the landscape maintenance shall be provided by Maynard Point, LLC.
3. Frequency of landscape maintenance:
    1. Twice a year, spring and fall, prune all trees and bushes
    2. Once every two years, during the spring, replace the mulch, removing old mulch and adding new mulch of same condition as when it was first prepared.
    3. Twice a year, seeing and fall, trees and shrubs shall be inspected to evaluate their health. Any dead or severely diseased vegetation shall be removed and replaced with similar plant.
4. During establishment of plant material, Applicant shall;
    1. provide 3’ deep holes for all bushes and perennial plants
    2. fill around the planted bush with a mix of humus and loam
    3. fertilize after planting for minimum of two months
    4. arrange for daily watering for a minimum of one month
    5. replace any bushes that did not establish within three weeks
    6. ensure that trees are with at least 3” caliber
5. Plant beds shall be maintained to be free of dead plant material, weeds and trash on a monthly basis.
6. There are no areas of lawn on the property, so no lawn maintenance required.
7. Organic products shall be used whenever feasible during installation, establishment and continued maintenance when considering the use of pesticides, herbicides, and fertilizing.

OPERATION & MAINTENANCE PLAN
Cultec Stormwater Management System
Maynard Point
42 Summer Street
Maynard, MA 01754

The CULTEC system designed for the multi-family building at 42 Summer Street, Maynard MA is equipped with an inspection port located on the inlet row.

Maintenance Guidelines

The inspection port is a circular cast box placed in a rectangular concrete collar. When the lid is removed, a 6-inch (150 mm) pipe with a screw-in plug will be exposed. Remove the plug. This will provide access to the CULTEC Chamber row below. From the surface, through this access, the sediment may be measured at this location. A stadia rod may be used to measure the depth of sediment if any in this row. If the depth of sediment is in excess of 3 inches (76 mm), then this row should be cleaned with high pressure water through a culvert cleaning nozzle. This would be carried out through an upstream manhole or through the CULTEC StormFilter Unit (or other pre- treatment device). CCTV inspection of this row can be deployed through this access port to deter mine if any sediment has accumulated in the inlet row.

Maintenance Guidelines

The following guidelines shall be adhered to for the operation and maintenance of the CULTEC stormwater management system:

A. The owner shall keep a maintenance log which shall include details of any events which would have an effect on the system's operational capacity.

B. The operation and maintenance procedure shall be reviewed periodically and changed to meet site conditions.

C. Maintenance of the stormwater management system shall be performed by qualified workers and shall follow applicable occupational health and safety requirements.

D. Debris removed from the stormwater management system shall be disposed of in accordance with applicable laws and regulations.

Maintenance Schedules

A. Minor Maintenance

The following suggested schedule shall be followed for routine maintenance during the regular operation of the stormwater system:

Frequency	Action
Monthly in first year	Check inlets and outlets for clogging and remove any debris, as required.
Spring and Fall	Check inlets and outlets for clogging and remove any debris, as required.
One year after commissioning and every third year following	Check inlets and outlets for clogging and remove any debris, as required.

B. Major Maintenance

The following suggested maintenance schedule shall be followed to maintain the performance of the CULTEC stormwater management chambers. Additional work may be necessary due to insufficient performance and other issues that might be found during the inspection of the stormwater management chambers. (See table on next page)

	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	• Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	• Clean stormwater management chambers and feed connectors of any debris. • Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	• Clean stormwater management chambers and feed connectors of any debris. • Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. • Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. • Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. • Attain the appropriate approvals as required. • Establish a new operation and maintenance schedule.

LONG-TERM POLLUTION PREVENTION PLAN
& Illicit Discharge Statement
Standard 10

Maynard Point
42 Summer Street
Maynard, MA 01754

1) Good housekeeping practices;
   a. As a standard practice of MacDonald Property Management, LLC, our Property Management company used to manage all of our apartments in Maynard, we set high expectations for how residents maintain both their personal space as well as common areas of the property, which are outlined the Contract that is agreed upon and signed between the Tenant and MacDonald Property Management, LLC. These standards have been crafted to include over 40 years of experience in Property Management, and their success can be evidenced in the properties located at 10-12 Main Street, 60-62 Nason Street, 6-8 Parker Street, 145 Main Street, 2 Florida Road, 9 Florida Road, 12-14 Florida Road, and 13 Florida Road properties.
2) Provisions for storing materials and waste products inside or under cover;
   a. Not applicable; there will be **no** storing of materials on site, and the only waste products will household garbage, which will be stored in the dumpster, enclosed in the dumpster shed.
3) Vehicle washing controls;
   a. Not applicable; there is, and will be, **no** availability for vehicle washing either in the parking lot above ground, or in the underground parking garage.
4) Requirements for routine inspections and maintenance of stormwater BMPs;
   a. Please see the O&M Lan for Cultic Stormwater Management System outlined in the Narrative.
5) Spill prevention and response plans;
   a. Not applicable; there will be no hazardous materials stored on site.
6) Provisions for maintenance of lawns, gardens, and other landscaped areas;
   a. Please see the Landscape Maintenance plan, as well as page C4, “Tree Plan”
7) Requirements for storage and use of fertilizers, herbicides, and pesticides;
   a. Not applicable; there will be no storage of fertilizers, herbicides, and pesticides on site, nor will there be use of these products.
8) Pet waste management provisions;
   a. Although our properties are pet-friendly, MacDonald Property Management does not accept dogs to live on site. The only animals that MacDonald Property Management would be small, caged animals and/or cats.
   b. Outlined in the Tenancy At Will contract are clear expectations around how the pet waste is properly disposed of (in the dumpster).
9) Provisions for solid waste management;
   a. Being a residential apartment building with an on-site dumpster, all solid waste will be disposed of in this dumpster. The dumpster will be emptied once a week by Mitrano Removal Services, LLC.
10) Snow disposal and plowing plans relative to Wetland Resource Areas;
   a. MacDonald Property Management, LLC is responsible for plowing the site, ensuring the parking lot and walkways are properly cleared, and storing the snow in the designated snow stock area (as outlined on sheet C2). When the snow area is full, MacDonald Property Management will be responsible for removing the snow from the site.
11) Winter Road Salt and/or Sand Use and Storage restrictions;

a. MacDonald Property Management, LLC will not store any salt piles, covered or uncovered, on the property at 42 Summer Street, Maynard. In the very rare case that Winter Road Salt/Sand would be used, it is used very sparingly, and spread evenly and thinly across only the uncovered area of the parking lot.

12) Street sweeping schedules;
    a. The paved area is to be swept a minimum of four times per year, at least once during April and again during September with a high efficiency vacuum sweeper or a regenerative air sweeper. If a mechanical sweeper is used, the paved area is to be swept a minimum of once a month.
13) Provisions for prevention of illicit discharges to the stormwater management system;
    a. Being a multi-family residential development, there will be no outdoor storage, outdoor process activities, dust or particulate generating process, illicit connections and non-stormwater discharges, or waste piles. There will be a single dumpster, which is contained inside a dumpster shed, designed to contain household waste and prevent pollutant discharge in stormwater.
14) Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
    a. MacDonald Property Management, LLC is owned and operated by James MacDonald, with over 50 years of experience in building, managing, and maintaining residential/ commercial property. He has trained his staff, Jacquelyn MacDonald and Melissa MacDonald over the last 15 years in best practices and expectations of building, managing and maintaining the properties owned by their company. Training includes shadowing, mentoring, and in-role guidance of maintaining the property and all items included in this Long-Term Pollution Prevention plan.
15) List of Emergency contacts for implementing Long-Term Pollution Prevention Plan
    a. President and CEO - James MacDonald - (781) 307-1684
    b. Property Manager & CFO - Jacquelyn MacDonald - (808) 352-3621
    c. Head of Maintenance & COO - Melissa MacDonald - (508) 221-4682

Construction Schedule for 42 Summer Street, Maynard, MA Project:

1 month :	Demo & Prepare Erosion control / Temporary Leaching Swale
1 month :	Excavating & Rear Retaining Wall
1 month :	Foundation
3 months :	Framing
1 month :	Roof & Trim
1 month :	Windows & Exterior doors
1 month :	Siding
1 month :	Rough Mechanical / Electrical / Plumbing
2 months :	Drywall
2 months :	Interior Doors & Trim
1 month :	Cabinets & Appliances
1 month :	Flooring
1 month :	Painting
1 month :	Finish Grading & Blacktop
2 months :	Landscaping & Misc.

Total : 20 Months from issues of building permit.

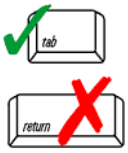
DETAILS OF THE SITE WORK:	
Install erosion control fence and Wattle rols	2 days
Demolition of the house will follow the removal of the tree	- 3 days
Complete Truck wash area	2 days
Remove paving and the top gravel base under -	3 days
Remove all top soil and bushes in the green areas	3 days
Prepare the construction drainage swale	3 days
Construct the rear retaining wall	2 weeks
Rough grading and fill	1 week
Seed & plant the green strip on the west property	3 days
.	
The finish grading will be after the structure is complete	2 days
The base course of the paving	3 days
.	
Seed and plant all remaining green areas after the paths are complete	1 week

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

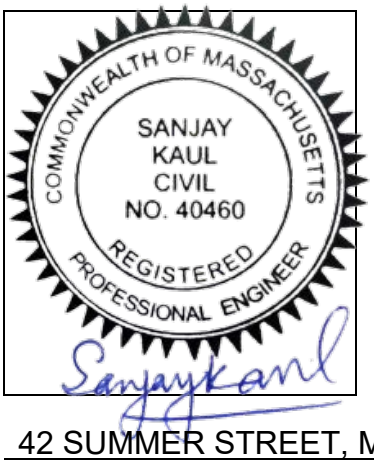
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



MAY 27, 19

Signature and Date

42 SUMMER STREET, MAYNARD, MA

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- [X] No disturbance to any Wetland Resource Areas
- [X] Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- [ ] Reduced Impervious Area (Redevelopment Only)
- [X] Minimizing disturbance to existing trees and shrubs
- [ ] LID Site Design Credit Requested:
  - [ ] Credit 1
  - [ ] Credit 2
  - [ ] Credit 3
- [ ] Use of "country drainage" versus curb and gutter conveyance and pipe
- [ ] Bioretention Cells (includes Rain Gardens)
- [ ] Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- [ ] Treebox Filter
- [ ] Water Quality Swale
- [ ] Grass Channel
- [ ] Green Roof
- [X] Other (describe): _____

Standard 1: No New Untreated Discharges

- [X] No new untreated discharges
- [ ] Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- [X] Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas. N/A

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☒ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

LALA ASSOCIATES ENGINEERS LLC

EIN 83-0920782

M.ASCE, M.SEI, M.NSPE, M.I.E.(India), M.AMWS, M.ACI, M.ICC

37 OLD VILLAGE ROAD, ACTON,MA 01720

LIC.# 40460-C(MA), 13350(MD),09227(NH), 084611(NY), 007736(VT)

www.lalaengineers.tk

Ref:12293.33 June 20,2019

Mr. Greg Tuzzolo, Chair
Town of Maynard Planning Board
195 Main Street
Maynard, MA 01754

Re: Application for Special Permit and Site Plan Approval - 42 Summer Street
LIST OF WAIVERS REQUESTED

Following is the list of waivers requested from the zoning requirements:

1. **9.4.10** - For the 24 units proposed, the parking spaces as required are 36 at the rate of 1 ½ spaces per unit; 34 spaces are proposed. A waiver is requested from the regulation.
2. **6.1.10.3** - Proposed front yard setback to the 1st parking space is a minimum of 6.9ft, and a maximum of 11.2ft. The side/rear yard setback is 2ft. A waiver is requested from the regulation requiring 20ft front yard setback for the 1st parking space, and 10ft side/rear yard setback, for the two handicap parking spaces.
3. **6.1.10.4** - Proposed 18ft minimum, 26.6ft maximum driveway width for two-way traffic next to parallel parking. A waiver is requested from the 24ft minimum.
4. **6.1.11.1** - Proposed spaces are 8x18 parallel and perpendicular parking.A waiver is requested from the standard size requirement of standard size 9x18.5. (Compact parking is8x15. None of the proposed parking stalls are smaller than 8x18).
5. **9.4.4** - Minimum Area of 1,500 SF per residential unit is not metwith current proposal. For providing less square footage i.e. 24 units at 956sf per unit proposed, a waiver is requested from the 1500 sf requirement.
6. **9.4.4** - Maximum front yard setback of 10-feet is not met with the current proposal. The angular setting of the building has varying setbacks at the front property line and is greater than 10-feet in some areas. A waiver is requested from this requirement.
7. **A.8** -Four (4) sheets (C2.1, C3.1, C4, and C5) are drawn at 1'=10' scale for clarity. A waiver is requested from the regulation.
8. **D.4** – A traffic circulation/impact study has not been provided for both the site and surrounding areas. A waiver is requested from the regulation.
9. **4.2.1** – The survey plan is stamped by a P.E. – not a Professional Land Surveyor. A waiver is requested.

Sanjay Kaul

(978)337-5252 lalaengineers@gmail.com

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

LALA ASSOCIATES ENGINEERS LLC....05/27/2019

Project: 42 SUMMER STREET
MAYNARD, MA
Owner: JAMES MacDONALD

T5 SEWER FLOW- RESIDENTIAL			GPD
BEDROOMS	30	110	3300
FACTORED AT	0.5		1650
PEAK FLOW	3.2		5280
FOR 4 HOUR PERIOD		GPM	22.00

Slope of 6" PVC PIPE 1.00% n= 0.011

Required diameter of the pipe running full = **1.33(Q n /S^.5)^3/8** 0.25 Inches

Flow capacity of 1 -PVC of size(D") 6 1.051 cfs 470.885 gpm

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6" Schedule 40 White PVC Pipe 4004-060AB - 5ft

★★★★★

1 review

$37.94

Qty: 1

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8" Schedule 40 White PVC Pipe 4004-080AB - 5ft

$55.00

10" Schedule 40 White PVC Pipe 4004-100AB - 5ft

★★★★★

12" Schedule 40 White PVC Pipe 4004-120AB - 5ft

★★★★★

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- 3 inch (1)
- 3 1/2 inch (1)
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